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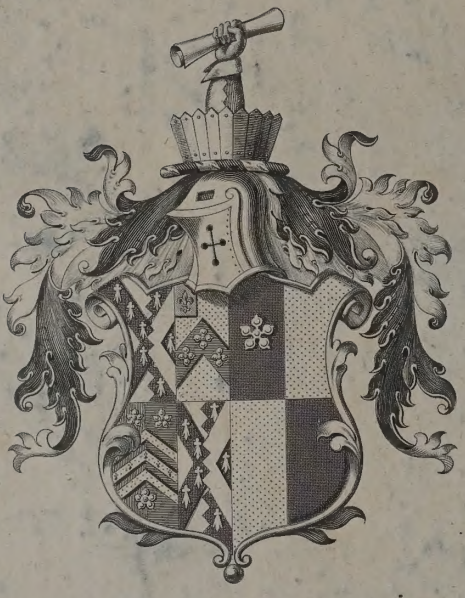

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THE

PRINCIPLES OF SURGERY,

VOLUME SECOND.

CONTAINING

THE OPERATIONS OF SURGERY.

PART FIRST,

THE OPERATION OF LITHOTOMY AND THE DISEASES OF THE URETHRA.

IN FOUR SECTIONS.

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2. THE HISTORY OF LITHOTOMY; OR, BIOGRAPHICAL, CRITICAL, AND HISTORICAL SKETCHES OF THE MOST FAMOUS LITHOTOMISTS, AND OF THEIR OPERATIONS 39

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THE ANATOMY BEING ILLUSTRATED BY DRAWINGS, AND THE OPERATIONS BY PLANS AND SKETCHES OF THE VARIOUS INCISIONS AND THEIR EFFECTS.

By JOHN BELL, Surgeon.

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1806.

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TO

HIS GRACE

HENRY,

DUKE OF BUCCLEUGH, *&c. &c. &c.*

WHOSE PRIVATE LIFE IS AN EXAMPLE;

WHOSE UNOSTENTATIOUS, BUT EXTENSIVE CHARITIES, ARE A BLESSING;

WHOSE PUBLIC VIRTUES, IN TIMES OF DISQUIET AND ALARM, HAVE BEEN A SUPPORT AND SAFEGUARD TO HIS COUNTRY;

THIS VOLUME IS PRESENTED,

AS A TESTIMONY OF RESPECT AND ESTEEM,

BY

THE AUTHOR.

PREFACE.

THIS is not a book of amuſement, but of inſtruction in a practical art, and I am conſcious that I meet my reader on very different terms from one who enters on a new enterpriſe in literature or general ſcience. In my own profeſſion, in ſubjects which I have ſtudied, both in books and at the bedſide of the patient, with perſevering induſtry, I may preſume to divine the wants of the younger part of my profeſſion, and may hope to deliver in plain and ſimple language, deſcriptions of diſeaſe, and rules of practice ſuch as men of experience and good ſenſe will acknowledge and receive. Queſtions of ſcience I hold it to be my privilege and indiſputed right, to diſcuſs with unlimited freedom: Having no maſter but my own diligence, I owe allegiance to none: But I have ever cheriſhed an enthuſiaſm for the ſcience to which I am devoted, and a ſincere reſpect for my profeſſion; and this feeling, which has been my ſupport in compoſing this ſyſtem of operations, brings with it, now that I am to ſubmit my work to the public judgment, many inquietudes. I muſt have felt little of this reſpect, or have profited little by ſuch feelings, if I had not, in entering upon a work ſo important, and ſo extenſive, reflected upon the plan of it, with all poſſible deliberation, and purſued my labour with anxiety and diligence, if I did not now preſent it to my profeſſion with unaffected

diffidence. To conceal the ſatisfaction I muſt naturally feel in having completed a long expected book, would ſavour more of hypocriſy than modeſty; no one ſurely, enters upon a taſk of this nature without the hope of being conſpicuouſly uſeful, and cruel ſhould his feelings be, if, after having beſtowed labour ſuch as I freely acknowledge to have beſtowed on this book, he were to ſink under a ſenſe of ſelf-condemnation; but to imagine ſuch a book perfect is a thought ſo vain and puerile, as I believe my worſt enemy will not accuſe me of. Without affected humility or miſplaced apologies for ſtile or manner, I proceed to claim that indulgence which I know I need: there are I fear, many faults in this work, which even my beſt friends and the trueſt lovers of ſcience will be ſenſible of: but a book once publiſhed, is like a life come to its final conſummation, irrevocable, needing no apologies, if generally good, admitting none, if it be not ſo. Whether I have been fortunate in the ſelection of my plan! whether the clearneſs of my explanations will juſtify the extent of them! whether my common ſtudies of anatomy and of ſurgery have enabled me to transfer from the one ſcience, what may prove uſeful in the other! whether a habit of combining thoſe two departments has ſuggeſted to me happy ſolutions of the difficulties of the ſcience, and good rules for operating, the profeſſion muſt decide: I make my appeal from the criticiſms of thoſe who have their purpoſes and their parties, to a profeſſion learned and liberal, and too widely diffuſed to feel any influence.

I have ventured to give a ſplendid form to a book of ſcience, and thoſe who love that ſcience as I do, will not be offended. I have preſumed to entitle this work, not ELEMENTS OF SURGERY, which implies a ſhort enumeration of diſeaſes and operations, but PRINCIPLES OF SURGERY, which implies ſuch a combination of anatomy,

pathology, and ſurgery, as may enable a man, not merely to perform inciſions or heal the wound he has made, but to reaſon upon the phænomena of diſeaſe, to prognoſticate, to decide and to operate. Pathology, in this part of my ſyſtem, is made the baſis of all reaſoning on the cauſe or conſequences of diſeaſe; and anatomy, the ſole rule of every operation; while hiſtory occaſionally introduced, ſerves to illuſtrate thoſe rules, and to confirm the young ſurgeon in the love of his profeſſion, by demonſtrating its ſlow progreſs and preſent improved ſtate.

The main purpoſe of this work is to connect anatomy with ſurgery; to remind the ſurgeon, already engaged in practice, of thoſe parts of anatomy which he is ſo apt to forget; to ſubmit to his review the hiſtory of operations, that he may make his election with the confidence of one who knows the ſources of knowledge, and who reaſons from the only ſure principle, the ſtructure of the parts diſeaſed: how I conceived ſo bold a deſign, which look like innovation, or preſumed to think myſelf capable of ſo great a taſk, I ſhall now endeavour to explain.

To ally anatomy more cloſely with ſurgery, to connect the art more intimately with the ſcience from which it flows, ſeemed to me a taſk as yet imperfectly accompliſhed and yet of the very higheſt importance.—The ſtudy of pathology contributes not merely to make the ſurgeon intrepid, bold, and ſkilful, but to keep alive thoſe ſentiments which give a peculiar value to his beſt and moſt ſacred duties. The continual reference of every ſymptom and ſuffering, to certain phyſical changes going on within the body, begets a lively ſenſibility for the feelings of the patient while he lives, or to his fate when life is in danger. The frequent reaſoning on thoſe changes, produces a talent for obſerving the courſe of diſeaſe,

and a calm, ſober, and ſerious turn of mind, not unfavourable to prompt deciſion and manly readineſs in circumſtances of preſſing danger. The ſurgeon who is ſkilled in prognoſtics, and familiar with the ſigns of danger, who is well perſuaded of the neceſſary and urgent motives which engage him in difficult operations, who is conſcious that he inflicts pain only to prevent long ſuffering, or endangers life only to preſerve it, can know no taint of fear. Without this ſcience to intereſt our feelings in every new ſcene of affliction, our profeſſion would be coldly practiſed: without this ſtudy of cauſes, and a continual ambition to come to every new conſultation, with new acquirements of knowledge, new precedents, and more deciſive facts, profeſſional men would languiſh in the purſuit of ſcience: without this philoſophical view of the parts and functions of the living body, practice is not experience, and gray hairs and length of years beſpeak only ſtubbornneſs in prejudice, and ill-founded claims of deference and reſpect.

Experience is obſervation founded on previous knowledge: but to prepare the mind of a young man for receiving the leſſons of experience, he muſt have the ſcience ſo digeſted, and its principles ſo diſplayed by the teacher, as to perceive, in one view, the natural and healthy ſtructure of parts, the changes produced by diſeaſe, the probable iſſue of thoſe changes, and the remedies and operations by which ill conſequences may be prevented. Such principles every man of real experience, founded on knowledge, treaſures up, perhaps unconſciouſly, in his own mind: But his knowledge is the ſlow acquirement of years paſſed in doubts and perplexities: very rarely are the principles of ſcience unfolded to the younger part of the profeſſion, ſeldom is the ſurgeon ſent abroad into the world with that fullneſs of knowledge or maturity of judgment, which he might

be taught to derive from a knowledge of anatomy, combined with the experience of individuals, accumulating through ages.

The preſent mode of teaching anatomy, tends little to excite this ſpirit of obſervation: He will have little ſympathy with the pains or ſuffering of his patient, who does not reaſon on what is going on within the body, who does not watch inceſſantly the ſymptoms indicating change, whether towards health or diſeaſe; and feel more fears and anxieties than his patient can imagine, and ſee dangers of which his friends cannot be conſcious. Such reaſoning repeated from day to day, is truly experience: The mind thus occupied in reaſoning, not upon an abſtract philoſophical queſtion, but on one which involves the fate of a fellow-creature, muſt be inſpired with ſentiments which they who know not our profeſſion, nor the beſt motives which excite us to diligence, believe paralyſed and deadened by frequent ſcenes of miſery.

Anatomy, far from being taught for ſo noble and uſeful a purpoſe, is taught as a taſk of the memory, and its applications, various and intereſting as they muſt be, remain ſtill problematical. Anatomy is not made intereſting to the pupil as the baſis of our reaſoning on diſeaſe, the rule of our prognoſtications the ſole guide in operating: he is taught to know the parts and remember their names, and then he is diſmiſſed from the ſchool; and of this ſchool we all are pupils, abandoned early in our career, left to learn in the hurry of practice, the very principles of the ſcience.

The anatomy of ſurgery differs widely from that taught in ſchools: it were better the young ſurgeon had no conception of the forms of parts, than ſuch as muſt be corrected by ſad experience; for the parts of the human body are preſented on the table of the anatomiſt, not only in circumſtances, but in forms, in which they can never

at any after period appear to the ſurgeon. If the bones are demonſtrated, they are not diſplayed clothed with their muſcles, and connected by their perioſtæum with the ſurrounding parts: they are not repreſented as parts of a living ſyſtem, nouriſhed by veſſels, and ſubject to changes and diſeaſes analogous to thoſe of the living body: theſe are conceptions which the ſurgeon attains by ſlow and painful experience, for his teacher aims only at making him know and remember proceſſes, and grooves and holes, which to know, is of no importance, and to remember impoſſible. The practical ſurgeon indeed learns by experience the changes of which thoſe apparently inanimate parts are ſuſceptible; but while he is obſerving how tumors alternately riſe and vaniſh, are produced by diſeaſe or cured by remedies; while he is learning to diſcuſs the tumors, to cure the ulcers, to deſtroy the dead, and to ſupport the living parts of a bone; while he is acquiring by experience all that he ſhould have been taught, all that makes anatomy uſeful, he believes that he is forgetting anatomy, becauſe he is forgetting a gothic and barbarous ſyſtem of names, remembers no longer holes and hollows of no import, and is exchanging the pedantic leſſons of the ſchools for a higher kind of knowledge.

It were better the ſurgeon had no conception of a Hernia, an Aneuriſm, a Hydrocele, than what he obtains from demonſtrations of the Peritonæum, the Abdominal Ring, or the Tunica Vaginalis, or the Humeral Artery; for on the anatomiſt's table he ſees thoſe parts under forms, which, through all his profeſſional career, he is doomed never to recogniſe again, but to look for them in vain, in all his own operations and thoſe of his friends, and that too in the moſt critical exigencies, where they ſhould ſerve as the mark and limit of the inciſions.

The anatomiſt deſcribes for example the ring or opening of the abdominal muſcles, and naturally mentions that it is the opening through which, in Inguinal Hernia, the bowels are protruded; but what avails ſuch a remark? there is no note taken of the various changes produced by this very protruſion, no additional deſcription to connect this anatomy of the ſound, with that of the diſeaſed part; the pupil is not told that he is never to ſee, in the living body, the ſame diſplay of a ring, fair, circular, and circumſcribed ſuch as is exhibited in the diſſection of the ſound body; the ſurgeon feels no ſuch ring in any operation, and doubts, and heſitates, expecting to recognize that circular opening which he thinks he knows ſo well, and has ſo often ſeen.

The anatomiſt, in his courſe of teaching, diſſects the Peritonæum, and deſcribing that membrane, according to the method of Haller, with all its involutions, and all its connections, the coats it forms for the viſcera, and the ligaments by which it binds each in its place, and he concludes with ſaying "this membrane, gentlemen, or a proceſs of it, is protruded through the ring, wherever the bowels are protruded, and forms the herniary ſac." But far different is the ſac which appears to the ſurgeon in the time of operating, thickened by inflammation, rough and irregular, from adheſion, connected, or rather confounded with the ſurrounding parts, imperfectly ſeen through the inciſions, and obſcured with blood, it is altogether unlike the delicate Peritonæum from which it takes its origin, and is no longer to be recogniſed as a proceſs of that membrane! The ſurgeon finds nothing correſponding with the demonſtrations he has ſeen, or the conceptions he has formed: anatomy, which he faithfully ſtudied, that it might be his guide in ſuch difficulties, ſerves only to bewilder and deceive.

The anatomiſt demonſtrates, from his preparations or diſſections, the courſe of the Epigaſtric Artery, compares its ſituation with that of either pillar of the ring, and calculates and conjectures how it may be avoided; he who never operated in hernia, projects rules for the ſurgeon, and inculcates them; and from his lectures ſuch rules are transferred to books, and paſs from age to age, for leſſons as important as they are formal. But when theſe ſame Pillars are no longer to be diſtinguiſhed, the opening betwixt them dilated, and every veſtige of this formal ring obliterated by frequent protruſions; when the deſcending bowels have puſhed aſide this artery, and a new order of parts is exhibited, unknown to the claſs demonſtrator, defying all calculation and conjecture, what muſt be the confuſion of the young unexperienced ſurgeon who foreſees no ſuch changes?

While anatomy is taught, only taught from diſſection of the ſound body! no deſcription, no drawings, no plans, nor ſchemes of the parts ſubjoined to correct the firſt impreſſions, to expreſs the new arrangements of parts which accident produces, to indicate the changes in form and texture produced by diſeaſe! the ſurgeon profits nothing by that ſcience which contains all the principles of his art. In Hernia the cauſe of death is aſcribed to the obſtruction of the bowels, and nothing is deſcribed but the ſigns of ſtrangulation; yet ſtrangulation is not the cauſe of death! The obſtruction of the inteſtinal canal is not the cauſe of death! The actual mortification of the bowel is not the cauſe of death! but that fever and inflammation of the abdomen, which affects the whole ſyſtem, and which is fatal, before the inceſſant vomiting could exhauſt the patient, or the actual gangrene deſtroy him. Yet we have no deſcription of this inflamed ſtate of the abdomen, it is not even noticed, while the ſigns, real and imaginary, of ſtrangulation, are minutely de-

tailed; we have no narrative of the ſymptoms which prognoſticate life or death, and the ſurgeon is hardly aware of his patient's danger, when hiccup, and other fatal ſigns appear.

In caſes of hernia, the various degrees and characteriſtic marks of abdominal inflammation, form the true grounds of our prognoſtics; the anatomy of the parts, in their altered condition, diſtended by frequent protruſion, and maſſed together by inflammation, is the rule of our inciſion; and yet we are referred to the old deſcriptions of the abdominal ring and peritoneal proceſs, for thoſe eſſential points of knowledge which are only to be attained either by frequent and careful obſervation while operating, or by diſſections of diſeaſed parts. Theſe are things which can be deſcribed only by the practical ſurgeon, by the man who has often, with a lively intereſt, obſerved and noted down the perplexing changes which he has met with.

Whence do theſe perplexities ariſe? from the ſeparate and independent ſtate of two departments in ſcience which are eſſentially and cloſely allied. The profeſſed anatomiſt ſits in his chair of dignity, explaining the ſtructure of parts, but with no reference to their condition in diſeaſe: he is no ſurgeon, he has not put his hand to the work, he has felt no difficulties, his hand has not trembled, nor his face blanched at the apprehenſion of danger; he has little intereſt in deſcribing difficulties he has never known, in anticipating anxieties and dangers which belong not to his department; he is employed on higher and more ſplendid, ſhould I not ſay more fantaſtic ſubjects of ſpeculation.—The ſurgeon again, who writes for the inſtruction of others, is often no anatomiſt, and accepts very gratefully, the imperfect rules for operating preſcribed by thoſe who never touched the knife; and thus it happens that

pathology, which ſhould unite ſcience with art, is a ſort of neutral ground betwixt the two provinces of anatomy and ſurgery, little regarded on either hand. The young man, ſtudying our profeſſion, learns his ſurgery and anatomy apart; to reconcile his firſt conceptions of anatomy with the changes which he is called to obſerve in his practice of ſurgery, is a ſpecies of reaſoning which accident ſometimes invites him to cultivate. But acquirements depending thus on opportunity, on accident, on time, which few can ſpare, and on that inceſſant diligence which is ſo apt to flag in the toils of daily practice and needful gain, are often imperfect even in the end of life; and when by continued diligence, a man attains a competent degree of knowledge for the ordinary duties of this profeſſion; the knowledge thus acquired, enters into his experience as an individual, and conſtitutes his reputation, while he lives; it is profitable and honourable to himſelf, and uſeful to his friends; but when he dies, it dies with him, and is not preſerved for the improvement of ſcience.

Pathology is at once the moſt uſeful and the moſt painful ſtudy: there is a ſort of ſatisfaction in finding our conjectures confirmed, our errors corrected, our knowledge continually improved by frequent diſſections; but the frequent diſſection of dead bodies, the act of reaſoning and reflecting on the various cauſes of our diſſolution, the ſight of the dead and the recollection of their laſt ſtruggles and ſufferings, the ſlow lifting up of the cloth, which veils the countenance of a deceaſed friend, caſts a gloom over a mind ſeriouſly engaged in thoſe duties. Yet ſo important is the duty of combining pathology with ſurgery, ſo eſſential is it to the ſound doctrine and diſcipline of ſcience, and to the perfection of our art, that I had rather publiſh to the world deſcriptions of diſeaſed urethra, and

ſwelled proſtate, ſuch as Hunter has delivered and repreſented in drawings, than be author of all the diſcoveries of the age in which he lived: I had rather give deſcriptions and drawings of the herniary ſac, in its various ſtages of inflammation and adheſion, or point out any thing which might facilitate ſo eventful an operation as that for hernia, than diſcover the pereneal myſteries of the thymus or renal gland. I had rather announce a ſeries of ſuch important facts, than ſhew myſelf the moſt ingenious among the dreamers of dreams, for of ſuch materials is produced the knowledge the moſt eſſential to the perfection of our art and the good of our fellow-creatures.

When we reflect on the incorrectneſs of our ſenſes, and the imperfection of memory, we are conſcious that in a ſcience important to mankind, nothing ſhould be left to recollection! every impreſſion of ſenſe ſhould be noted down the moment it is diſtinguiſhed! and from time to time thoſe deſcriptions of evaneſcent impreſſions ſhould be reviſed and compared. We remember, for example, with lively feelings, a ſcene in nature, an intereſting converſation, or the form and manners of a friend, and we think that of ſuch a ſcene or of the terms of the converſation, or of the features and forms which have pleaſed us, we have the moſt lively recollections; but when we attempt to repeat the words, or trace the features with the pencil, when we would aſcertain our conception and put it to the proof, our recollections vaniſh like a ſhadow or a dream! impreſſions, which we believed permanent and luminous, are quite obſcure, and tantalize us with a ſenſe of diſtinctneſs which we cannot realiſe. How dangerous this in matters of ſcience? If it be preſumptuous in a painter to draw a likeneſs from memory, what muſt it be for a ſurgeon to truſt to recollection for thoſe ſigns which are to warn him of approaching

danger, or for thoſe deſcriptions of diſeaſe, thoſe marks of parts, which are to direct him in operating?

Habits of induſtry, which I know not whether to attribute to chance or deſign, have enabled me to compoſe, for my own uſe, the deſcriptions of diſeaſe, and plans of operations which I found wanting in books of ſurgery, and diligence is a talent in ſuch low eſtimation, that it will not be thought preſumptuous, if I claim this kind of praiſe, neither will it be conſtrued into affectation, if I declare that whatever excellence I have attained in my profeſſion, ariſes from mere diligence, from perſeverance in ſtudy, and fidelity in obſervation. In the moſt ordinary duties, faithfully performed, I have ever found the beſt ſources of uſeful knowledge: I never yet attended the pooreſt creature in an hoſpital, without taking an intereſt in his diſtreſſes, and uſually a drawing of his diſeaſe; nor have I neglected, in private practice, to record and treaſure up my opinions of my patient's caſe, my hopes, my ſucceſſes, and my diſappointments, more faithfully than I have recorded my fees. I have never, with unhallowed hand, attempted any dangerous operation unprepared, truſting to my general knowledge of anatomy, or experience in operating; but have ſet me down to conſider ſeriouſly of every danger, to plan the relative ſituations of parts, to provide for every exigence, to recollect the courſe of the great nerves or arteries which were endangered in the diſſection, and to imagine every poſſible alteration in their courſe or form. In every caſe of fractured ſcull, of ſtrangulated hernia, or of inflammation of the abdomen, in every variety of diſeaſes of the lungs, of the throat, or of the glands, I have marked, from hour to hour, the ſymptoms, have made drawings from every diſſection, and have written down, at the moment of witneſſing any intereſting ſcene, the impreſſions

it made upon me, and thoſe characters of diſeaſe, and thoſe ſigns of danger which are ſo evaneſcent. In every Tumor of the neck or jaws, which needed to be diſſected out, I have made new plans of the carotids and the accompanying nerves, marking the branches which were endangered in the operation. In every caſe of Polypus I have drawn accurate plans of its relations to the palate and noſtrils, to the bones or cavities of the noſe or throat. In every Fiſtula I have drawn ſchemes aſcertaining the direction of the various paſſages, their relation to the external openings, to the diſeaſed urethra, and to the ſtricture which cauſed the confuſion of parts; and when I turn over thoſe caſe books, ſo precious to myſelf, I cannot but hope to make them uſeful to others; for with theſe ſilent monitors I conſult, and ſometimes find my conjectures concerning the diſeaſe, belied by experience, or my plans of operations corrected by diſappointments! but always I feel my knowledge of my profeſſion improving, and am conſoled with the reflection of not having ſpent my years in indolence, nor claimed any degree of confidence to which I have not this title at leaſt of diligence and labour.

Many things conſpired to confirm me in this habit of diligence: I felt that an operation to be performed with confidence, muſt be carefully planned; that to loſe the beſt fruits of experience by a ſelf-indulgence, by a lingering and idle humour, was unmanly; to think over every ſubject anew, ſeemed in ſo far as related to myſelf an endleſs toil, and unprofitable to that profeſſion, to which I was publicly pledged, as a teacher and as an author. To think with accuracy, I found it neceſſary to think with my pen, or my pencil in my hand; with theſe I reſolved, to my own ſatisfaction, every ſurgical problem, and ſoon found that my command of facts accumulated, that my general knowledge improved, that my reſources

were expanded, that no caſe occurred without having its precedents to ſerve as a rule for my conduct, without analogous facts to give it importance! and every time I renewed my plans of hernia, aneuriſm, or tumor, I was conſcious of having more diſtinct views and bolder conceptions of my duties as a ſurgeon, and of gaining daily acceſſions of knowledge which, without this faithful practice of ſtudying every caſe, would have been ſtopped in their ſource.

Yet I do not deny that habits, uſeful in themſelves, may have led me into faults very grievous, to even the beſt diſpoſed of my friends; my habit of reaſoning on ſurgical queſtions, not by deſcriptions, but by diagrams, by appealing not in abſtract reaſoning to the imagination, but to the ſenſes, by plans of the parts, may have led me into prolixity, repetitions, and pleonaſms of every kind, and may have increaſed the bulk and price of this volume. But my conſcience dictated to me, that in matters of life and death, accuracy could not be a fault; that in a work of ſcience, ſplendor of execution, not oſtentatious, but plainly uſeful, would not, with the lovers of ſcience, be a ſin unpardonable.

OF THE TALENTS REQUIRED IN AN OPERATOR.

While the ſcience of pathology aſcertains the changes produced by diſeaſe, prepares the young man for practice, and enables him to form a juſt conception, and a true prognoſtic in every caſe of danger; it is the ſtudy of anatomy, and the habit of diſſecting with addreſs, that fits him for operating. I am aware that few ſurgeons are deſtined to become operators, or have ever, from their firſt entering into the profeſſion, felt any thing but horror at the ſight of blood; yet, the talent of operating is deſirable, as it implies a per-

fect knowledge of the ſtructure of the human body, and a ſuperior ſkill in all the ordinary duties of the profeſſion: to acquire this talent (for it may be acquired) is a fair and laudable object of ambition, and carries the young ſurgeon into the moſt uſeful of all ſtudies, that of diſſection: to acquire this talent is not only honourable to himſelf, and ſatisfactory to his friends, but is almoſt eſſential to his own peace of mind: he knows not by what unexpected accidents he may be involved, unawares, in difficulties of this nature, how ſoon he may, through the intereſt of his friends, be charged with the care of a great hoſpital, and find occaſions of laudable ambition opened to his view, and opportunities of being eminently uſeful to numbers of his fellow-creatures! his ſituation, in remote parts of the country, may require him to operate on the poor, and if engaged in foreign ſervice, or in the colonies abroad, he may find himſelf involved in difficulties which will bear hard upon him. But the young ſurgeon who has made this department his ſtudy, is no ſooner engaged in practice, than he becomes conſcious of the ſuperiority it gives him; he is able, with honour, to ſeize whatever opportunities preſent themſelves, of promoting his own intereſt, or ſeeking reputation; and he feels himſelf performing, with alacrity and confidence, thoſe higher duties which often caſt a gloom over the minds of thoſe leſs perfectly educated.

Of all the unhappy feelings which the duties of our profeſſion entail upon us, none are more oppreſſive than thoſe which precede any eventful operation. They naturally ariſe from the reſpect we muſt have for the life and health, the pains and ſufferings of a fellow-creature, who commits himſelf into our hands with entire reſignation. They are avowed by men above all affectation. "If (ſays Cheſſelden) I have any reputation in this way, I have earned

it dearly, for no one can endure more anxiety and ſickneſs before an operation, yet, from the time I begin to operate, all uneaſineſs ceaſes." Cheſſelden though above all competition in this line, a perfect anatomiſt and a bold operator, yet felt and acknowledged theſe compunctious viſitings of nature; but if to thoſe natural fears were joined the ſlighteſt doubt, in the mind of the ſurgeon, whether he could perform his duty, ſhould we wonder to ſee his hand tremble, ſhould we wonder to ſee him preparing for a public operation, with all the feelings of a criminal, and performing it under confuſion, embarraſſment, and viſible concern. It is only a conſciouſneſs of being ignorant of anatomy, and unaccuſtomed with diſſection, a fear or ſuſpicion of ſome unknown and indefined danger, that perturbs the judgment, and unſteadies the hand, and makes a bad operator retire from ſuch a ſcene, if he be at all ſucceſsful, with an exultation of heart which he cannot conceal, and which proves but too plainly that he himſelf imputes his ſucceſs to chance and good fortune.

Nothing ſhould be left to chance where life is concerned; theſe feelings of anxiety ſo natural, ſo honourable to the man who confeſſes them, can be leſſened only by a careful education, and eſpecially by being perfectly familiar with anatomy. He ſurely will feel the moſt perfect compoſure of mind who is prepared for every operation, that is, for every diſſection that may be performed upon the living body, by having frequently diſſected the ſame parts in the dead. The young ſurgeon acquires, by frequent practice, a familiar acquaintance with the ſeveral parts, and a freedom in diſſection, which makes dexterity a natural habit; he learns to compare the ſize, relation, and connection, of the ſeveral glands, nerves, and arteries, and is ſo familiar with the external and viſible forms

which denote their place, that, before operating, he can put his finger on a part and ſay, whether, any danger lies within; he comes inſenſibly to think, without diſmay, of dividing thoſe parts in the living body, which he has often diſſected in the dead; and is able to perform an operation, as he would a diſſection, with the ſame fearleſs and rapid execution, where rapid execution is ſafe.

Moſt unhappily, an opinion has prevailed that the talent of operating is a gift of nature, not to be acquired: that men are born operators: and from this term natural operator, even men of ſenſe and judgment do not revolt. The danger of this opinion requires, that the ſubject ſhould be ſeriouſly conſidered, for it is grievous to think what a relaxation of diſcipline, what a falſe and miſplaced confidence may ariſe from ſuch a prejudice, what daring unprincipled attempts to ſnatch at reputation, by thoſe who imagine themſelves natural operators, and who ſlightly run through ſuperficial education, to ruſh at once into practice.

That a man, to become an operator, ſhould be born with good natural talents, with a quick eye, and a ſteady hand, a mind endowed with firmneſs and courage, is indeed eſſential: But it is not leſs eſſential that he ſhould ſtudy that profeſſion to which he is to apply thoſe natural powers; for of themſelves, unqualified by education and knowledge, theſe natural powers are but the worſe and more dangerous part of the character which the ſurgeon aſſumes, ſince, with the conſciouſneſs of natural addreſs and courage, unſupported by ſkill, he may be induced to attempt operations unprepared, which are to be plainly learnt by diſſection.

There is no ſuch character as that of a natural operator, nor is

there any other profeſſion, learned or unlearned, which makes ſo bold a claim: A muſician, a painter, a poet, become ſo by ſtudy and diligence: excellency, even in the works of genius, is attained only by labour, by the cultivation of the natural powers: If ever there was an inſpired poet, it was Milton, who pours out his prayer "to that eternal ſpirit, that can enrich with all utterance and knowledge, and ſends out his cherubim, with the hallowed fire of his altar, to touch and purify the lips of whom he pleaſes." Yet Milton boaſts not of inſpiration, he prepared himſelf with diligence, meditating during many years, his immortal poem: he ſays, "I hope by labour and intenſe ſtudy, which I take to be my portion in this life, joined with a ſtrong propenſity of nature, I may leave ſomething ſo written to after times as they ſhould not willingly let it die."

Have we ever heard of a natural painter, a natural engraver, a natural muſician? no, ſurely! labour and ſtudy muſt be joined with the ſtrong propenſity of nature. Enthuſiaſm for the beauties of nature, and admiration of the works of art, are the indications of genius; the paſſion for imitation creates only the deſire; it is the handling of the tools of the engraver, the chiſſel, and the pencil, that gives the power of performing; and this power, improved by diligence and ſtudy, improves, in its turn, the genius of the artiſt: his flights of genius are bold and noble, whoſe fervour is not repreſſed by difficulty of execution, but who can give force to the higheſt conceptions of his mind.

Is it then natural to know the human body without diſſecting it? is it natural to operate on the living body without knowing its parts? no, let every young man, who is to ſtudy our profeſſion,

diſſect with unwearied diligence, all the parts and organs of the body, and then only will he be able to know whether he was born an operator.

But I have obſerved thoſe natural operators. One, perſuaded that he is ſuch, confident in his own natural powers, goes unprepared, to do the moſt important operations: he regards even the firſt opportunity of operating as an occaſion of acquiring reputation, and making a public diſplay of his talents: he truſts to chance, and hopes to find himſelf a natural operator; and dreadful muſt that misfortune be, which can perſuade him that he is not, for while chance is allowed to have ſo great a ſhare in his ſucceſſes, it is but too natural for him to impute every misfortune to chance. Natural powers he may perhaps boaſt of, his eye may be as keen, his hand as ſteady, his mind altogether as bold and fearleſs as that of a well-inſtructed man. But it is a boldneſs not qualified by knowledge, and if ever the ſlighteſt doubt comes over his mind, if his operation be perplexed or interrupted by any unexpected event, if once the occaſion for real courage overtakes him, his hand trembles, his head ſwims, he would give the world that he might without ſhame and ruin lay down the knife! this is the cauſe, the ſole cauſe, of that exultation, which bad operators, when they are at all ſucceſsful, cannot conceal.

He who believes himſelf born with theſe natural talents, affects the manner of thoſe who have attained to the reputation of being dextrous operators: his mind is not wrought up to any intenſe feeling of what his patient ſuffers, nor occupied with an intenſe deſire to relieve him from the agonies of the operation: occupied ſolely with the vain and dangerous paſſion for applauſe, he thinks only how he may appear in the eyes of ſpectators. What are the

ſpectators, and what is their applauſe, to the life of a fellow-creature? yet I fear that the cuſtom of making every operation, every neceſſary and unavoidable cruelty of our art, a public ſpectacle for ſtrangers to gaze on, and allowing the claims of thoſe who diſregarding all the aids of ſtudy and experience, boaſt only of their natural talents, has been attended with the worſt of conſequences. Even in private life, operations have been hurried, which might have been deliberately and ſlowly performed: But the hoſpital ſurgeon, like one exhibiting on a public ſtage, loſes no occaſion of charming his aſſemblage of ſpectators, into an opinion of his ſuperior ſkill; hence his operation is all confuſion and hurry, the inciſions are performed with affected dexterity, the purpoſes of the operation are but ill accompliſhed, the arteries are imperfectly ſecured; and, in the end, he huddles up his work, to keep his time and to preſerve the opinion, perhaps to excite the plaudits, of an unjudging mob. This paſſion for applauſe, ſo natural to us, ſo ſubſervient to our intereſts, ſo flattering to our ſelf-love, ſo apt to be excited by the preſence of ſtrangers, who are never to ſee us again, and are to judge of us by one ſingle act of ſkill and courage,—this ſelfiſh and dangerous paſſion, which every ingenuous man muſt confeſs he feels lurking within his own breaſt, cannot be guarded againſt too much! If it is ever to be completely extinguiſhed, it muſt be by a thorough ſtudy of the principles of the ſcience, for a perfect education will carry a man's thoughts beyond this poor ambition.

A man perfectly educated, who is accuſtomed with diſſection, and has fairly cultivated his natural powers, is occupied with higher thoughts. He looks inward for approbation, and cares not for the ignorant applauſe of thoſe who eſtimate his talents, by the rapidity of his ſtrokes! by the movements of a ſtop-watch! He imitates

nothing of the turns and motions of others, every movement of his hand and knife, is his own, and has a meaning, while the whole deſign of the operation is perfect in his mind. He has no vain nor ſelfiſh wiſh, no feelings, but thoſe of confident expectation and an intenſe deſire to give relief; is abſent to all external impreſſions, and unconſcious of any thought which does not relate to his patient's ſafety. He affects no maſterly turns of his knife or hand, no rapidity of execution, no airs of ſelf-approbation to extort applauſe; but performs his operation in that calm ſolemn and impreſſive manner, which perſuades his patient moſt eloquently of his deep regard; his whole deportment ſhews how conſcious he is that he is inflicting cruelties, which, though well deſigned, may not prove uſeful; and though planned and conducted with prudence, may endanger life. If he operates with confidence, it is not of that raſh and headlong nature, which ariſes from a vain aſſumption of natural abilities, of native courage, of addreſs and dexterity inherited from his birth, but ſuch as proceeds from a rational and modeſt ſtudy of that knowledge which is eſſential to ſucceſs.

That in taking leave of my reader, I ſhould feel ſome anxieties, is moſt natural; but that I ſhould feel an irreſiſtible deſire to vindicate thoſe peculiarities in my mode of reaſoning or of teaching, which ſeem to myſelf the moſt laudable! to apologize for thoſe plans and drawings which I have found ſo uſeful, and for that profuſion of illuſtration which I could not abridge! that I ſhould be inclined to apologize even for the elegance of my book, ſeems

to myſelf ſurpriſing! Yet on theſe delicate ſubjects I cannot refrain from ſaying a few words.

It may be difficult for my reader to believe, while he ſees before him a long and boundleſs narrative, adorned with ſketches of biography and morſels of criticiſm, relating rather to authors than to operations, that it was my ſincere deſire to concentrate and compreſs ſuch preliminary knowledge into the ſhorteſt bounds, or to teach it in the moſt ſimple form. But clearneſs and ſimplicity were on thoſe ſubjects ſo inconſiſtent with brevity, that I could myſelf arrive at no deciſive and ſimple principle, without reviewing many ſubordinate queſtions, nor ſatisfy my own mind, nor produce truth to others, without a full inveſtigation, hiſtorical and critical: But I had the happineſs to find that every particular criticiſm contained its own leſſon in ſurgical practice. Were the alliance of pathology with ſurgery fairly made out, and become an eſſential part of the education of every ſurgeon, I might then announce, in few words, the deſign and purpoſe of each operation for lithotomy, adding expreſs and definite rules for the manner in which it ſhould be performed. But this ſimple method involves no proceſs of reaſoning, nor of teaching, brings no conviction home to the mind of the reader, does away no prejudices, eſtabliſhes no important truths, nor helps to develope the principles of the ſcience, it is rather the rudiments of the ſcience, and the mere index for a book. My enterpriſe was of a more difficult and complicated nature; but if from a complication of knowledge and variety of illuſtration, I have not deduced ſimplicity of principle, I have certainly failed.

In this firſt part of my ſurgical operations, it is my deſign,—firſt, to lay before my reader a ſketch of the anatomy and pathology of

the parts contained within the pelvis, as the only juſt ground of theory on the diſeaſes of thoſe parts, and the ſole rule of our operation :—ſecondly, to explain the doctrines and deſigns of each lithotomiſt, as the beſt comment on thoſe principles, and as conveying the moſt precious leſſons of ſurgery, in the moſt inſinuating form :—thirdly, to cloſe this general pathology with a view of the various cauſes of obſtruction of urine, the unhappy conſequences to be apprehended from any breach in the urethra, and an account of the leſſer operations required in all the varieties of obſtruction and fiſtula, and finally the operations of introducing the catheter and of tapping the urinary bladder.

Plans and drawings are with me a habitual mode of aſcertaining my own conceptions, and of preſenting them to my reader, and like diagrams in mathematics or mechanics, they form ſo ſure a proceſs of reaſoning, and ſo ſimple a mode of repreſenting and proving every important fact, they are indeed ſo eſſential to the correctneſs of my own views, and to the impreſſing the leſſons upon my reader's mind, that it were better I had not written the hiſtory of various operations, than not have explained the direction of the inciſions, and their probable conſequences, by plans.

While I reviewed the theories of the older lithotomiſts, and compared their operations with each other and with thoſe of modern times, I found the peculiar character of the individual ſtill mixing itſelf with his projects, and could form no ſure concluſion on the merits of his deſign, without eſtimating his prejudices, his doctrines, his opportunities of attaining knowledge, the ſchool in which his talents were ripened, and the theories of the age in which he lived; till I had gone through this long proceſs, I not only could not pronounce truly on the advantages of his operation! but could

not be aſſured of the facts! rarely do we find a man ſo ſincere in the love of ſcience, ſo ingenuous and faithful in relating his experiments, ſo impartial in his own cauſe, as to expoſe fairly the ill ſucceſſes of a favourite operation: ſo what he wiſhes to prove, he thinks he proves; what he is inclined to reject, he finds out reaſons for rejecting.

If drawings and plans be thus eſſential, I need not fear to compare thoſe of my preſent volume, with the groteſque repreſentations which we find in various books, not of pieces of anatomy, or plans of operations, but of obſolete inſtruments! groups of patients and ſurgeons! drawings, which have deſcended through many generations, from Tollet, Garengeot, Heiſter, in uninterrupted ſucceſſion. We are preſented with pictures, ill drawn at the firſt and worſe copied in every ſucceeding book, of patients placed in the poſture for lithotomy (who does not know the poſture for lithotomy?) with aſſiſtants, piled one above another, according to the true principle of the pyramid! But they are much fitter to ſerve as benefit-tickets for Sadler's Wells, with groups of tumblers, and ſtrong men, performing their feats, than as the ſerious and important drawings of a book of ſurgery.

In books ſtill more modern, we find a wonderful œconomy, both in reſpect of invention and execution, for the drawings are only ſketches of knives, and gorgets, and ſtaffs, and theſe are copied from each other through time immemorial. The celebrated Mr. Sharp condemned the multitude of inſtruments as a diſgrace to ſurgery, and Mr. Pott declared that almoſt every thing might be done with a ſimple ſcalpel. I have ſeen, in avowed contradiction to theſe great practical ſurgeons, a profeſſor's table encumbered with inſtruments of all ages; and in the books of ſurgery we find, at

every turning of a leaf, a picture of a crooked knife. Such embelliſhments remind me of a little book of the hiſtory of Scotland, which I delighted much to read in my younger days; the carver of wooden plates, who had been employed to decorate the work, having a juſt conception of the ferocious feudal times, to which the ſaid hiſtory related, and having moreover a due ſenſe of œconomy, engraved two cuts, the one was that of a bloody battle, with ſpears, and axes, and bows, the other was that of a traitor drawn limb from limb, by wild horſes; and the two plates ſucceeding each other, alternately, adorned very handſomely, the whole volume, and like pictures of knives, in a book of ſurgery, were ſeldom out of place.

If we but conſider the numbers of excellent engravers, two thouſand perhaps in the city of London alone, adminiſtering to a vicious and pampered taſte, embelliſhing new editions of hiſtorians and poets, with ſuperfluous drawings and vignettes, or decorating our chambers with prints, faſhionable to-day, and caſt aſide to-morrow, it will not ſeem unreaſonable, that one engraver ſhould be employed, for one year, in contributing to the advancement of a ſcience in which all men have an intereſt. Anatomical drawings may, in ſome degree, ſupply the place of diſſections, aſſiſt in connecting the two departments of ſurgery and anatomy, repreſent with more particular accuracy, thoſe pieces of anatomy which, though uſeful in our profeſſion, are neglected in a general courſe of demonſtrations, and remind the ſurgeon engaged in actual practice, of things too apt to be forgotten, and yet moſt eſſential to his ſucceſs; and therefore, though aware of what may be ſaid, I am nothing doubtful of the propriety of what I have done. Drawings of anatomy and plans deduced from theſe draw-

ings, being always acceſſible to any ſurgeon, may eventually ſuggeſt the moſt important meaſures in the moſt deſperate caſes, and enable an ingenious man to form intereſting conjectures concerning the cauſes of diſeaſe or the means of relief, and qualify him for interpoſing in caſes of extreme danger and alarm. In all varieties of ſituation, abroad or at home, in country or in town, ſketches of ſurgical anatomy will be uſeful to the profeſſion, by reviving the recollection of paſt ſtudies, and will enable the ſurgeon to prepare himſelf for his operation, not by reading imperfect deſcriptions, but faithful repreſentations of the parts.

LITHO-

LITHOTOMY.

SECTION I.

ANATOMY OF THE GENITAL PARTS AND OF THE VISCERA OF THE PELVIS.

It is the great and peculiar excellency of our profeſſion that all its facts are ſenſible and demonſtrative; that its problems admit of direct and plain ſolutions; that the axioms and principles of the ſcience are to be found in the ſtudy of anatomy. In ſurgery we ſeek for no other authority than the anatomy of the human body; we need not go to the writings of Greek or Roman authors to learn how the parts may be moſt ſafely divided in the operation of the Stone. To the ancients, unacquainted as they were with anatomy, we deny all ſuch pre-eminence, and decide on the faults or excellencies of their operations according to the immutable principles of the ſcience; for their operations, though invented and performed without any reference to principles, muſt yet abide this teſt. It is not then with the deſign of learning the principles of our profeſſion that we review the projects, criticiſe the operations, and enquire into the ſucceſſes of the older ſurgeons; but with the ſole view of making ourſelves more familiar with the anatomy of the parts of generation, for every time we reflect on any particular operation we learn to conſider the parts and their relations to each other in ſome point of view not till then thought of, and while we reflect on the advantages or dangers of the various forms of inciſion we improve in knowledge; we learn to reaſon more correctly; we learn to compare the parts with each other in every poſſible form and poſture; and it is by thus acquiring a correct and perfect knowledge of the parts, and a lively recollection of their forms, poſtures, and bearings, that (after examining all other modes of inciſion), we are enabled to perform our own favourite or accuſtomed operation with

ſteadineſs and ſkill. Such are the advantages of anatomical principles and of critical and hiſtorical knowledge which mutually aſſiſt each other and improve at once the head and hand of the ſurgeon.

I am now to explain an operation, which, more than any other, requires a perfect knowledge of anatomy; for however properly trepan or amputation may be performed by thoſe unaccuſtomed to diſſection; lithotomy and hernia and aneuriſm, the extirpation of tumors, and all the delicate operations in ſurgery, can be performed by thoſe only who are thoroughly acquainted with the anatomy of the parts.

In a book of ſurgery, good drawings are a fair ſubſtitute for actual diſſection; and anatomy, in ſo far as it is ſubſervient to ſurgery, muſt in an elementary book of ſurgery be taught anew. A piece of ſurgical anatomy, i. e. the accurate methodical diſſection of the parts divided in any particular operation, differs widely from any ſlight view that may be given in the general demonſtrations of the anatomy of the human body: after general anatomy has been taught, ſurgical anatomy ſtill remains to be explained and applied.

Drawings then are the repreſentations of this anatomy, and involve in their explanation the chief practical leſſons in ſurgery. Drawings enable us to diſtinguiſh the parts moſt important for the ſurgeon to obſerve; and as they enable us even more than an actual diſſection, to mark diſtinctly the proportions and relations of parts to each other, they are effectually the proofs of what may be ſafely attempted, and the diagrams by which every difficult queſtion in ſurgery may be finally reſolved. No ſurgeon can at once engage in actual diſſections and in the toils of practice, drawings muſt therefore ſerve to the practical ſurgeon as memorials and records of knowledge formerly attained, while the rules for operations muſt be founded on an accurate repreſentation of the parts. Drawings of ſurgical anatomy ſhould be made only by the ſurgeon himſelf; for he repreſents the proportions, poſtures, and relations of parts to each other with a degree of accuracy to which the mere artiſt never can attain, and with views and intentions which the mere artiſt can neither conceive nor execute. To place a diſſection of certain parts before an artiſt, and explain their uſes and connections, is only to perplex him with matters which he can never comprehend; to require him firſt to draw thoſe parts of which he has no correct ideas, and then to invent from his drawings, plans and diagrams explaining the rules of practice, would be not merely abſurd in itſelf but highly dangerous to the profeſſion; and yet plans and diagrams invented

after correct and careful drawings, are the only means of teaching what the ſurgeon actually performs, while with his knife he diſſects deep among the parts, where the ſpectators no longer ſee the forms of his inciſions; where he himſelf is no longer guided by the eye, but directed by feeling with his finger, and by his perfect knowledge of anatomy.

I proceed then to initiate my reader in that line of ſtudy which I have myſelf found uſeful. The deſign of this particular ſection is to enable the young ſurgeon to renew and to perfect his ſtudies, by diſſecting the parts of Generation as in the actual operation of cutting for the ſtone; to revive in the minds of thoſe who are already employed in practice, the recollection of a piece of anatomy ſo intereſting in every point of view, and yet ſo eaſily forgotten; I hope that even thoſe who have long practiſed the profeſſion will find ſomething uſeful in the obſervations which I ſhall take occaſion to make in explaining the anatomy of the parts; and I am inclined to believe that the practical ſurgeon will from reading deſcriptions, acquire greater facility in introducing the catheter, in feeling and diſtinguiſhing from the rectum (or through the inciſions for Lithotomy) the ſeveral points of the urethra, bladder, and proſtate gland, and will be able to puncture the bladder with more confidence, and to cut for the ſtone with deciſion and ſkill.

With this explanation of the drawings I chooſe to begin, becauſe this enables me firſt, to demonſtrate the anatomy, mutual relation and intimate ſtructure of the ſeveral parts; and ſecondly, from that demonſtration, to deduce plans and illuſtrations applicable to all the various operations; and to theſe drawings I ſhall hereafter appeal for the truth of every theoretical concluſion, and the correctneſs of every rule of practice.

The general plan of theſe illuſtrations is as follows: the four firſt drawings explain the whole anatomy of the parts lodged within the pelvis; the fifth and ſixth drawings explain the muſcles and other parts which cloſe the opening of the pelvis; the ſeventh and eighth drawings repreſent the two ſucceſſive inciſions of Lithotomy; firſt, that through the membranous part of the urethra made by the knife; and ſecondly, that through the proſtate gland made by the gorget; while the ninth drawing explains ſome very eſſential and important circumſtances, as obſerved in the body of a man who had been unſucceſsfully cut for the ſtone, and the ſtone left in his bladder, ſo as to occaſion his death.

THE FIRST DRAWING

Is deſigned to ſhew the parts as torn from the pelvis, with all that looſe cellular ſubſtance by which they are connected; becauſe it is of the firſt importance to obtain correct ideas of the bending of the urethra, the place of the proſtate gland and veſiculæ, and the mutual connections of the rectum and bladder. In this drawing the parts are preſerved very nearly in their natural relation to each other, and they are drawn almoſt of their natural ſize.

THE SECOND DRAWING

Is deſigned to ſhow the penis, urethra, proſtate gland, veſiculæ, diſſected, clean, and laid out in a direct and ſimple poſture; becauſe it is of importance that ſurgeons ſhould know the preciſe form, ſize, and proportion of the ſeveral parts unembarraſſed with any connection with the ſurrounding viſcera, and cleared of cellular ſubſtance. In this drawing, the urethra, the membranous or naked part of that canal, the proſtate gland, the veſiculæ, and the muſcular fibres of the bladder, are all diſtinctly ſeen.

THE THIRD DRAWING

Is deſigned to ſhew the parts once more, in their natural and undiſſected condition within the pelvis, and connected with their cellular ſubſtance; the *levator ani muſcle* which covers equally the bladder and the rectum, and in a manner lines the pelvis, is alſo fully diſplayed, becauſe this moſt important muſcle is little known: in reſpect of ſize, of fleſhineſs, of fibre, it greatly exceeds what is uſually imagined from deſcription: and its action creates great ſympathy among the parts, and explains the ſymptoms of various diſeaſes: it is neceſſarily divided in every operation on thoſe parts; and moſt unfortunately, the ſlighteſt error in the diſſection of this muſcle prevents the eaſy introduction of the gorget. To the imperfect knowledge and incorrect diſſection of the levator muſcle muſt we impute the horrible accident of the gorget miſſing the bladder, and being driven among the adjacent parts.

THE FOURTH DRAWING.

Preſents to view the levator muſcle thrown down; the membranous part of the urethra, the proſtate gland, and the veſiculæ, which all lie under it; diſſected and

Anatomy of the Parts.
First Sketch.

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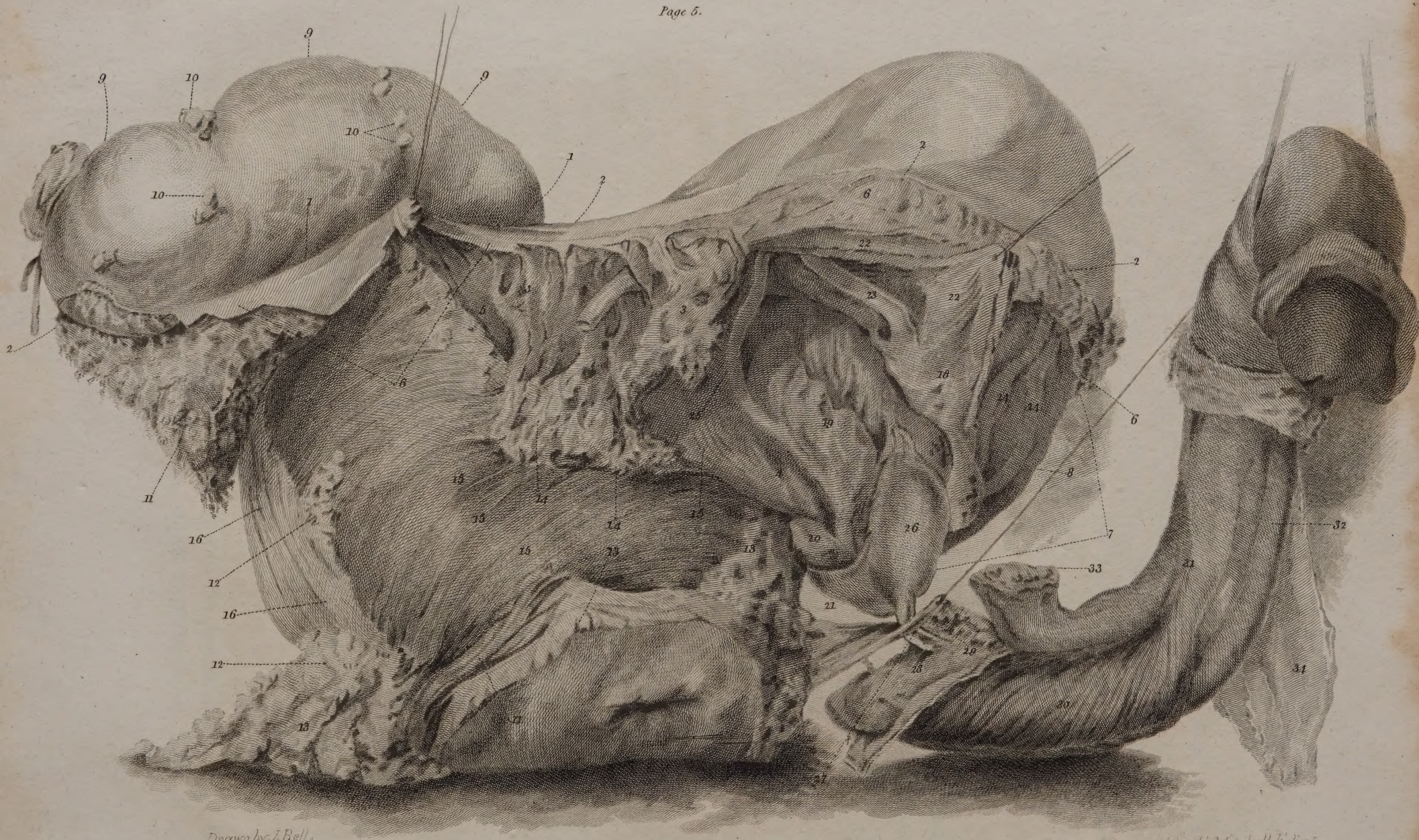

Drawn by J. Bell.

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Engraved by E. Mitchell Edin.r

diſplayed, for the diſſection of this muſcle is an eſſential ſtep in the demonſtration of thoſe parts; the relation of the levator ani to the rectum, bladder, and perinæum, are important in every ſenſe, and without this ſtep of the demonſtration being carefully explained; the ſurgeon could not underſtand, how deep the proſtate lies, through how thick and fleſhy a part he has to diſſect after having cut through the ſkin and fat, before he arrive at the proſtate; nor could he be ſenſible without this demonſtration, of the importance of diſſecting this muſcle fairly, nor imagine the confuſion that muſt enſue when the fibres of this muſcle being imperfectly diſſected, cloſe again ſo as to cover the inciſion or ſlit made in the urethra, and prevent the introduction of the beak of the gorget into the groove of the ſtaff.

THE FIFTH DRAWING

Completes the demonſtration of the anatomy of the parts; for it ſhews how the pelvis is cloſed from without, by powerful muſcles; how the accelerator urinæ covers the bulb of the urethra; how the tranſverſalis perinæi croſſes the perinæum and aſſiſts in retracting the rectum when protracted; how the ſphincter ani cloſes the opening of the gut; and how all theſe muſcles, by their cloſe union with the levator, become as it were parts of one great muſcle, cloſing the outlet of the pelvis, reſiſting the protruſion of the rectum, ſupporting the viſcera, and ſerving as a ſort of antagoniſt muſcle to the diaphragm, by which the viſcera are preſſed downwards in every act of reſpiration *.

EXPLANATION OF PLATE FIRST.

The whole pelvis is occupied by the bladder and rectum, which may with propriety be named the viſcera of the pelvis; and in the firſt drawing, on which my reader is now to keep his eye, theſe parts are repreſented in the following circumſtances: they are rudely torn out from the pelvis as in an ordinary diſſection ſurrounded by all their fat and cellular ſubſtance, yet ſeparated ſo far as to ſhow their general forms, while all their more important connections are left entire. But the

* In this general enunciation of my ſcheme, I explain only the anatomy of the parts as demonſtrated in the four firſt drawings, reſerving the explanation of thoſe drawings which mark the forms of the ſeveral inciſions in the operation of lithotomy, for another ſection.

rectum, bladder, and proſtate gland, though their natural connections are in ſome degree preſerved, are not preciſely in their natural poſture; the bladder is drawn away from the rectum, on which it naturally lies, ſo as to ſhow the looſe cellular ſubſtance by which the rectum and bladder are joined; the bladder is turned over to one ſide, that the lower ſurface of it being expoſed, the veſiculæ ſeminales and proſtate gland may be the more diſtinctly ſeen. The penis is ſuſpended by a ſtring, and another ſmaller ligature draws the urinary bladder aſide, and gives tenſion to the edge of the peritonæum.

1ſt. The rectum and bladder ſo entirely occupy the pelvis, that all the lower part of the bladder, and the whole of the rectum, is embedded in fat and connected with the ſurrounding bones by a looſe cellular ſubſtance; all the upper part of the bladder is covered with the ſmooth and firm membrane of the peritonæum; the peritonæum is here ſeen paſſing from the rectum over the fundus of the bladder, and the cut edge marked (1) is held up by a ſtring to ſhow the looſe cellular ſubſtance which connects the bladder and rectum within the pelvis. The edge of the peritonæum (1 2) marks the natural diviſion betwixt the abdomen and the pelvis; the bladder and rectum are thus excluded from the general cavity of the abdomen; and in conſequence of this natural diviſion the operation of lithotomy is leſs dangerous for the interpoſition of this membrane while it divides the pelvis from the abdomen limits the inflammation cauſed by lithotomy to the cavity of the pelvis *alone*.

In caſes of difficult delivery with forceps or the crotchet in women, or after the operation of lithotomy in men, we ſometimes find the inflammation extending to the peritonæum, and then the abdomen ſuppurates. The peritonæum continues, in caſes of puerpural inflammation, to pour out an immenſe quantity of thin ſerum, like the ſynovia of a diſeaſed joint, mixed with pus. This matter flows in ſuch profuſion, that I remember ſeveral caſes in which it ſoaked through beds and mattreſſes and ran down upon the floor; the woman dying with a puerperal fever generally on the ſixth or ſeventh day. But after the operation of lithotomy I do not remember that the belly has ever ſuppurated, except in one boy of ten years old, in whom the abſceſs was opened at the navel and the boy ſurvived.

The inflammation which ſucceeds lithotomy is limited to the pelvis; the matter forms among the looſe cellular ſubſtance lying betwixt the rectum and bladder, where the urine alſo ſpreading, ſometimes produces gangrene, or making its way among the parts produces fiſtulas; this looſe cellular ſubſtance is marked (3 3 3); and it is here worth remarking that when Raw, in imitation of Frere Jaques, and

Cheſſelden, in imitation of Raw, opened the bladder, not by dividing the proſtate gland, but by cutting behind it, the part of the bladder that was ſtruck, was the ſpace marked (4), betwixt the veſiculæ ſeminales, viz. theſe lithotomiſts ſtruck their knives into the flat part of the bladder which lies upon the rectum; and thence the ſwelling of the bruiſed proſtate gland hindering the egreſs of the urine by the natural paſſage, and the looſe cellular ſubſtance receiving the extravaſated urine, ſuch irregular ſuppurations were formed, that Cheſſelden (who, when he had contrived for himſelf a better operation, loſt but one patient out of twenty-eight) loſt actually four patients out of ten by this deep inciſion.

There is another circumſtance reſpecting the line of the peritonæum which deſerves notice. The peritonæum as it paſſes off from the forepart of the rectum riſes over the bladder: where it paſſes from the one to the other it makes a ſort of ſacculus in the direction (5) at the ſides of the pelvis; the folds of this membrane have ſomewhat of the form of ligaments, and indeed theſe are juſt the edges and foldings that being in women reflected from the ſides of the uterus, are called the ligaments of the womb, though they do in no ſhape regulate the poſtures nor motions of the womb. The peritonæum, when it riſes over the fundus of the bladder, adheres to it very firmly, and is very hard, conſtituting the external coat of the bladder; but where the peritonæum thus covers the bladder, the bladder is not ſo dilatable as in its lower part, therefore the peritonæum only caps the bladder as it were; it covers only one third or leſs, the reſt of the bladder, which is the dilatable part of it, lies embedded in the cellular ſubſtance of the pelvis. Now it is from this circumſtance of the peritonæum reaching down but a very little way towards the pubis, and from all the dilatable part of the bladder being below, that the bladder, in its diſtended ſtate, carries the peritonæum before it, ſo as to preſent a ſurface above the pelvis, where it is poſſible, without wounding the peritonæum, to cut into its body. This is called the high operation for lithotomy. The inciſion is made above the ſymphyſis pubis, the bladder being previouſly diſtended to its utmoſt by injections; the loweſt line of the peritonæum is marked (6); the part of the bladder which lies againſt the inner ſurface of the pelvis is marked (7); the ſpace which may be opened without wounding the peritonæum is marked (8).

OF THE RECTUM.

We ſhall now deſcribe this view of the rectum more particularly, and as my reader runs his eye downwards along the inteſtine, the ſeveral figures will denote the following circumſtances of its ſtructure and connexions; (9) marks that part of the rectum which lies above the peritonæum within the cavity of the abdomen, or rather what is ſeen here is the ſygmoid flexure of the colon, where that inteſtine terminates in the rectum or ſtraight gut; for the rectum or ſtraight part of the gut lies chiefly below the peritonæum. This ſygmoid flexure is marked chiefly by the ſmoothneſs of its ſurface, by the quantity of fat that appears ſhining through the peritonæal coat, and by the pendulous maſſes of fat (10 10) which hang from the ſides of the gut, and reſembling the fat of the omentum, are named Appendices Epiploicæ. This cut part of the inteſtine is tied, becauſe the lower part or rectum is ſlightly inflated to keep it in a natural poſture with regard to the bladder.

Figure (6) marks the line of the peritonæum dividing the pelvis from the abdomen; (9) that part of the rectum or of the colon rather, which lies within the proper cavity of the abdomen, unconnected with any other part, floating in that cavity like the other inteſtines, and covered with the ſmooth and lubricous membrane of the peritonæum. All below the line of the peritonæum is within the proper cavity of the pelvis, where the rectum lying in the hollow of the ſacrum is connected by cellular ſubſtance with that bone, and ſurrounded even in the leaneſt ſubject with maſſes of fat. (11) marks that maſs of fat by which it is connected with the upper part of the ſacrum; (12) marks thoſe pellotons or bundles of fat which run all along the poſterior parts of the inteſtine; (13) marks that particular quantity of fat which ſurrounds the cavity, and in which the ſphincter ani is involved, and which filling the outlet of the pelvis, occupies in an eſpecial manner the great hollow which is under the Tubur Iſchii, betwixt it and the anus; and as it is in this hollow that the inciſion for lithotomy is made, this is the maſs of fat which we have to cut through, often to the depth of three inches, in performing the operation upon a luſty man. (14) marks thoſe bundles of fat and cellular ſubſtance by which the rectum is connected with the upper and back parts of the bladder, and in ſhort the quantity of fat ſeen in this view is ſuch, that we cannot wonder at the frequence of fiſtula or abſceſs among cellular ſubſtance ſo very looſe, nor at the ill ſucceſs of thoſe operations in which the lithotomiſt cut deep into this hollow. (15) marks the tranſverſe muſcular fibres of the rectum; and (16) marks longitudinal muſcular fibres very ſtrong,

running longitudinally along the gut in three or four broad bands, and which, from their perpendicular direction, and the peculiar form they give this part of the gut within, are named the pillars of the rectum; (17) marks the ſphincter ani, a broad and fleſh muſcle ſurrounding the margin of the gut, of which but a ſmall part is ſeen in this drawing.

OF THE BLADDER, VESICULA, PROSTATE GLAND, AND URETHRA.

The ſhape of the urinary bladder in man is very peculiar; in the lower animals the fundus or bottom is the larger part, while the bladder becomes gradually ſmall towards the neck; but in man the fundus is ſmall and conical, while the lower part is broad and flat. The rectum is received as it were into a broad hollow betwixt the two bulgings of this broader part of the bladder; the two bulgings of the ſide of the bladder are very big and ſaccular, reſembling two bags on each ſide of the rectum; under theſe bulgings, i. e. betwixt them and the forepart of the rectum, lie the two veſiculæ ſeminales; and the ends of the veſiculæ project at the two ſides from betwixt the bladder and rectum, while the points of the veſiculæ converge and meet nearer the proſtate gland. The triangular ſpace betwixt the veſiculæ is a hollow impreſſed as it were on the lower ſurface of the bladder by the bulging ſhape of the rectum; this is the ſpace into which the trochar is ſtruck when we perforate the bladder from the rectum, it is alſo the part which was aimed at by the old lithotomiſts.

In this view the bladder is ſomewhat raiſed from its natural poſition and laid over to one ſide; (4) marks the hollow which receives the convexity of the rectum; (18) marks the lateral bulging of the bladder on which the veſiculæ ſeminales marked (19) lie; (20) marks the veſicula ſeminalis of the left ſide; and (21) marks the meeting of the two veſiculæ, their ducts running in together under the head of the proſtate gland. This lower or back part of the bladder then is not covered by any bulky parts, it lies upon the forepart of the rectum, and when the bladder is diſtended, the fluctuation of the urine may be eaſily felt here, by introducing the finger into the anus, and at this point the bladder may be tapped by introducing a long trochar, guided by the finger; but it is particularly to be obſerved that it is only in obſtructions from diſeaſe in the urethra, that the bladder may be tapped; for in the more frequent obſtruction ariſing from a ſwelling in the proſtate gland, the increaſed ſize of the proſtate removes the body of the bladder farther back, inſtead of this thin and membranous part of the bladder

the bulky ſwelling of the gland preſents itſelf; and the ſurgeon who does not diſtinguiſh accurately with the finger, who does not underſtand both the natural form of thoſe parts, and the effect of diſeaſe, inſtead of ſtriking his trochar into the bladder itſelf, will drive it deep into the ſubſtance of the proſtate gland; he will draw off no urine, the operation will rather confirm the obſtruction, and ſuch a wound, added to the preſent ſuffering of the patient, may bring on mortification and death! I ſpeak only of what I have ſeen, I am ſorry to ſay, more than once. This is what the ſurgeon might conclude a priori if he would condeſcend to ſtudy the proportions of the parts in health and in diſeaſe, for a ſwelled proſtate actually occupies the outlet of the pelvis ſo entirely as to give a flattened form to the fæces as they paſs.

But though no bulky parts are interpoſed betwixt the rectum and bladder, the ſides of the bladder and of the rectum are connected with each other by being both involved in one thick and maſſy muſcle named the Levator Ani. This muſcle is not diſtinctly ſeen in the preſent drawing, it is of neceſſity diſſected off to ſhow the hollow betwixt the bladder and rectum where the veſiculæ lie, but though diſſected it has not been entirely cut away. The maſs marked (22), which is turned back ſo as to diſplay the veſiculæ, conſiſts of a part of the LEVATOR ANI muſcle involved in fat; it is held aſide by a ſtring; it is ſeen connected by cellular ſubſtance with the ſides of the bladder, and the lifting up of this maſs, beſides ſhowing the cellular interſtice betwixt the bladder and rectum, and the veſiculæ, ſhows alſo the URETER (23) embedded in fat and entering the bladder a little above the veſiculæ ſeminales, in a manner which will be more diſtinctly repreſented in my third drawing.

The oppoſite ſide of the bladder which lies under the pubis is ſtill ſurrounded by the ſame looſe cellular ſubſtance, and by the ſame maſſes of fat. The ſpace marked (7) lies under the pubis; the veins marked (24) belong not merely to the coats of the bladder, but ſeem to convey away the blood from the penis, and there is a vaſt plexus of veins lying betwixt the forepart of the proſtate gland and the inner ſurface of the pelvis, of little importance indeed, in conſidering the operations which may need to be performed on thoſe parts, but particularly worthy of notice in conſidering the ſtructure of them. The cellular ſubſtance here is looſe, a circumſtance eſſential to the free motion of the bladder; the interpoſition of ſuch quantities of fat betwixt the bladder and rectum, and indeed every where within the pelvis is but an accident proceeding from the looſeneſs of the cellular

ſubſtance. The fat under the peritoneum where the bladder lies againſt the pubis is here repreſented in large maſſes; the difficulty of diſtending the bladder ſo as to raiſe the peritoneum to a due diſtance above the pubis and to enlarge the ſpace (8) ſo as to admit the high operation, was much complained of by Douglaſs, and occaſioned the death of many of his patients; for in ſeveral the peritoneum was cut, and the bowels fell down among the operator's hands; and even when this ſpace was large enough to admit a free inciſion, the looſeneſs of the cellular ſubſtance here, as at the lower part of the bladder, occaſioned ſuch depoſitions of urine and matter among the cellular ſubſtance, and under the muſcles, as often occaſioned death.

The veſicula ſeminalis of each ſide, lies flat betwixt the rectum and bladder; the ureters and the ſeminal ducts run towards the neck of the bladder nearly in one direction, but they come from very oppoſite points and therefore in this diſſection they are neceſſarily ſeparated from each other; the ureter (23) is drawn away from its natural direction and raiſed up together with the fat, and the portion of the levator ani under which it lies. The vas deferens or ſeminal duct (25) by which the ſemen is conveyed from the teſticle to the veſicula ſeminalis, turns from the teſticle over the forepart of the os pubis, enters the ring of the abdominal muſcles, paſſes along the ſide of the bladder, runs down the back of the bladder, and going along betwixt the lower part of the bladder and the fore part of the rectum, terminates in the veſicula ſeminalis. This long courſe of the vas deferens among the cellular ſubſtance on the ſide of the bladder is diſtinctly ſeen in this drawing; but the naked forms of the ureter and ſeminal duct, and the manner in which they croſs each other, are better ſeen in the ſecond drawing; in the third plate the direction in which the ureter enters the bladder, and in which the vas deferens joins the veſcicula are very well diſplayed.

From the bladder which we have deſcribed in all its circumference, we return to deſcribe the PROSTATE GLAND, URETHRA, AND PENIS. The ſpace marked (4) is the naked and flat part of the bladder which lies upon the rectum; the veſicula ſeminalis of the right ſide is marked (19); that of the left ſide is marked (20); the meeting of the two veſiculæ under the proſtate gland is marked (21); and here the ſeminal ducts running under the ſubſtance of the gland penetrate the neck of the bladder preciſely at the commencement of the urethra, where they lie cloſe together; their entrance makes a long ſhaped bulging, and the openings of the ducts give that bulging ſome ſlight reſemblance to the head of a wood-cock, and

the part is thence named Caput Gallinaginis. The proſtate gland is marked (26); the older anatomiſts always ſpeak of this part in the plural number, they conſider the gland as double, many who preſumed to deſcribe the proſtatæ took their ideas of the gland on report, without ever having ſeen it. The proſtate gland is a large firm and ſolid maſs ſurrounding rather the neck of the bladder than the beginning of the urethra; it is ſo far double that it has two remarkable bulgings on each ſide, which yet form but one maſs; the intermediate part which lies directly under the bladder and upon the rectum, though flat is exceedingly thick. The gland is altogether of a conical form or like the ace of hearts on playing cards; it is bigger than the largeſt cheſnut and nearly of the ſame ſhape; it entirely ſurrounds the neck of the bladder, though the chief maſs of the gland lies below the beginning of the urethra and very little of it lies above. This gland, inſtead of being formed in two lobes (as one would ſuppoſe from the old deſcriptions) with regular ducts leading from each lobe, is one complete gland with numerous ducts, ſeven or eight of which are ſeen diſtinctly on each ſide of the caput gallinaginis, opening with mouths ſo open and large that we can eaſily introduce briſtles into twelve or fourteen of them.

The proſtate even in its natural unenlarged ſtate, is eaſily felt from the rectum by introducing two fingers into the gut; it is firm and hard and in its texture a good deal reſembles a diſeaſed ſcrophulous gland; it lies ſo upon the neck of the bladder and preſents itſelf ſo directly within the external inciſion of lithotomy, that to make the inciſion of the bladder behind the gland in the ſpace marked (4) has been always found difficult; to dilate the gland and force it open with inſtruments after cutting the urethra is almoſt impoſſible, and never to be accompliſhed without dreadful laceration; the manner of dividing or of dilating this gland therefore has been the chief queſtion in lithotomy.

From the point of the gland the urethra emerges naked and membranous; this membranous part of the urethra is, a ſpace marked (27), about an inch in length; it is naked becauſe the proſtate has ceaſed to ſurround it, and the bulb or cellular part of the urethra has not begun to cover it; it is called membranous from its thinneſs, yet is not entirely without ſupport, for this delicate part of the urethra is tied firmly to the arch of the pubis by a ligament, a ſtrong triangular ligament which fills the lower part of the arch of the pelvis, and allows the membranous part of the urethra to paſs through an opening in it. In conſequence of this paſſage through the ligament the direction of the urethra is ſomewhat altered, the catheter

when it ſtops, is always interrupted juſt at this turn which is cloſe under the pubis; it was at this point that on account of the difficulty of paſſing it, the old ſurgeons made what they called their cunning turn or "*tour de maitre.*" I mark this difficulty becauſe it muſt never be out of the ſurgeon's mind when introducing the catheter, that particular addreſs is neceſſary at paſſing this point, and that as the catheter is then preſſing againſt the naked and membranous part of the urethra, it is apt to tear it and make a falſe paſſage.

But it muſt be remarked that in this drawing the membranous part of the urethra is not ſeen in its true direction, for the bladder being pulled away from the rectum has diſtended the urethra; the true drawing of any part repreſents the actual forms of the parts and their proportions, and the manner of their connexion by cellular ſubſtance; but the ſtrict relation of the ſeveral parts to each other as it exiſts not in the diſſected but in the entire and living body, can only be repreſented by plans; it ſeems a ſoleciſm, yet it is true that plans or *imaginary* drawings are neceſſary to correct the true drawings of the parts.

The part next in order is the bulb of the urethra marked (28); it is a cellular ſubſtance ſurrounding the lower part of the urethra, of which the following circumſtances are worthy of notice: firſt, this cellulated ſubſtance is formed diſtinct from the urethra, and altogether independent of it; it ariſes from no bone or ligament, is ſurrounded with its own firm coat which gives it its form, and contains that blood which is always circulating in it; the bulb of the urethra is formed an inch or more below the place where it begins actually to ſurround the canal; and this part upon which the figure (28) is placed, has no connexion with the urethra; is independent of it; and is named the pendulous part of the bulb. Secondly, From this point (29), when the pendulous part of the bulb is actually connected with the urethra, the urethra and the ſpongy or cellular ſubſtance of the bulb become as one; this cellular ſubſtance is called therefore the Corpus Spongioſum ipſius Urethræ and this corpus ſpongioſum or cavernoſum, ſo cloſely ſurrounds all parts of the urethra, that the ſlighteſt breach of the inner membrane is immediately followed by a diſcharge of blood. Thirdly, It is to be remarked that the blood which is found in the corpus ſpongioſum is not, as is uſually imagined, injected occaſionally into the cells by the action of the arteries, or occaſionally accumulated by the compreſſion of the veins, it is perpetually circulating there, the cells are continually full of blood, which is as it were ſecreted in this cellular ſubſtance by the arteries of the penis, and the penis is diſtended to erection by an occaſional excitement of

thoſe arteries, pouring out this blood in more than uſual quantities. The cellular bodies of the penis then are like veins ſometimes particularly dilated, but always full of blood; the bulb of the urethra is alſo thinner in its coat than the reſt of the penis, and has a very free communication with the pudic veins; it is itſelf properly a dilated vein; it occupies the whole length of the perinæum, and is of ſuch delicacy that while the ſlighteſt injury of the inner membrane cauſes hæmorrhage from within the canal of the urethra, a blow on the perinæum burſts it; then its blood being extravaſated into the common cellular ſubſtance, ſpreads ſo that all the ſkin over the perinæum and down the thighs, and along the groin, becomes black with extravaſated blood; the blood continues to exude into the cellular ſubſtance under the ſkin; blood is alſo diſcharged at firſt in a full ſtream and afterwards in great clots from the urethra; the parts are ſo crammed with the extravaſated blood, that the canal of the urethra is compreſſed by it; the urine is obſtructed, and the following accidents happen! The patient the firſt time he attempts to paſs urine, has the ſenſation of diſcharging it, and yet none runs out by the yard; he continues preſſing, and the urine ſpreads from the breach in the urethra among the ſurrounding cellular ſubſtance; the gangrene which at firſt was apparent only from the extravaſation of blood, becomes real from the extravaſation of the urine, which is ſo hurtful to the cellular ſubſtance that it never can reſiſt it; ſloughing of all the ſkin of the perinæum and ſcrotum enſues, and ſometimes incurable fiſtula. Such are the frequent conſequences of the burſting of the bulb from a kick or blow upon the perinæum.

The ſlip of fibres which traverſes the membranous part of the urethra and which is held aſide in this drawing by a thread marked (29), is not as it ſeems a muſcle, nor any parcel of muſcular fibres; it is a cord of veſſels ſurrounded with a fibrous cellular ſubſtance, the arteries in this bundle of cellular ſubſtance are thoſe which go to the root of the penis, and enter into the cavernous bodies of the penis and of the bulb; theſe are the arteries which fill and diſtend the cells, and the cordon of fatty fibres and arteries is held aſide to ſhow the manner in which the membranous part of the urethra unites with the bulb.

From this pendulous part the bulb is continued along the urethra eaſily diſtinguiſhable by its bulk for nearly three inches; this continued body of cellular ſubſtance is bulky and turgid, occupies the whole length of the perinæum from the place where the ſcrotum hangs pendulous to the verge of the anus; it appears when diſſected, of a livid colour, from the blood it contains ſhining through its thin but

Anatomy of the Parts.
Second Sketch.

Explained page 15.

Drawn by I. Bell.

Engraved by W. Skelton.

firm coats; it may be felt turgid during the erection of the penis; we are very ſenſible of the action of the muſcle with which it is covered during the ejaculation of the ſemen and of the laſt drops of the urine, for the whole length of the bulb is covered with the EJACULATOR URINÆ MUSCLE, of which the fleſhy belly with ſtrong oblique fibres running round the bulb, is marked (30); the tendon of the muſcle which is fixed into the ſide of the penis, ſo as to give the muſcle a powerful action upon the bulb is marked (31).

This muſcle the accelerator (which will be better ſeen in future drawings,) involves the whole bulb, conſiſts of two ſets of oblique fibres ariſing from one common ſeam along the middle of the bulb, and terminates in two broad flat tendons which lay hold on each ſide of the penis; it is from its office named EJACULATOR URINÆ ET SEMINIS.

The corpus cavernoſum urethræ (32) continues, though ſmaller, from the place of the ejaculator muſcle, and covers the whole of the urethra till it terminates finally in the glans penis.

The right corpus cavernoſum penis forming one ſide of the proper body of the penis, is marked (33) at the place where it is cut off from the os pubis whence it ariſes, and its bloody cells are ſeen in this cut ſurface.

The whole penis is ſurrounded beneath the common integuments (and above its proper coats) with a firm tendinous ſheath or faſcia, which prevents overdiſtenſion and binds it firm in erection, juſt as the faſcia common to muſcles gives them firmneſs in action; a part of this faſcia marked (34), is here diſſected and left hanging down, thin, but ſtrong and firm, and of a tendinous nature.

In this drawing the ſcrotum only is cut away, the ſkin of the penis is thruſt upwards along the body of the penis, and the penis is ſuſpended in a natural poſture by a tape.

SECOND DRAWING.

In this view the diſſection of the parts is perfect, they are now diſtinctly ſeen unincumbered with any other parts, and cleared of their cellular ſubſtance; the bladder, urethra, and penis, are laid out upon the diſſecting board, and that ſurface

of the bladder is turned upwards, which naturally lies upon the rectum, and which is the ſubject of our chief operation; this drawing is a neceſſary ſupplement to the firſt, in which not the preciſe form ſo much as the general connexions of parts is ſeen, and is a uſeful introduction to the third, in which the ſame parts together with the muſcles which compreſs the rectum and bladder are diſplayed.

The body of the penis is compoſed of two corpora cavernoſa which receive and contain the arterial blood poured into their cells; theſe cellular or cavernous bodies ariſe one on each ſide of the arch of the pubis from the branch of the os iſchium; they conſiſt of a ſtrong tendinous coat, from all parts of the ſurface of which thoſe abſorbing veins ariſe, which beginning in ſmall branches encircle the body of the penis and meet in one great trunk on the back of the penis, named the Dorſal vein; the corpora cavernoſa are divided from each other by a ſeptum or middle partition, but that partition is ſo perforated that the communications of the two corpora cavernoſa are as wide as the teeth of a large comb; ſo that the partition, inſtead of ſeeming to ſeparate the two lowermoſt bodies, ſeems chiefly uſeful by conducting two central arteries, which run up through the centre of the penis, and pour out blood, each into its reſpective ſide of the penis.

Thoſe two cavernous bodies are marked (a a) at the beginning where they ariſe from the arch of the pubis, and at (a a) are ſeen the cells; at (b) theſe two bodies unite and continue united to form the body of the penis; but the glands is differently formed, has little connexion with the body of the penis; is united with the body of the penis merely by cellular ſubſtance; and is formed of the corpus ſpongioſum urethræ.

The CORPUS SPONGIOSUM URETHRÆ begins not from any bone or other firm part; it commences in what is called the bulb of the urethra; the pendulous part of the bulb which lies cloſe upon the anus is marked (c), and in this drawing the pendulous part being very little inflated, makes no very remarkable figure; it is into the extremity of this pendulous part that the two arteries enter which pour their blood into it; the whole of the bulb which occupies the whole of the perinæum, is covered with the accelerator, and ſeems formed on purpoſe to give effect to that muſcle; the bulbous part of the urethra ceaſes at (d), where the accelerator muſcle ends, but the ſame cellular body (e e) (diſtinct from the corpora cavernoſa penis), accompanies the urethra the whole way, till, at the point of the urethra it is dilated ſo as to form the glans (f). After injecting this corpus cavernoſum ipſius urethræ with wax, we find innumerable ſmall veins filled, which emerge from the cellular

ſubſtance, encircle the penis, and form the vena dorſalis; theſe corpora cavernoſa of the penis and of the urethra, are in themſelves ſtrong, and are ſtill farther braced by a general ſheath or faſcia, ſuch as ſurrounds the muſcles of a limb formed of the ſame tendinous ſubſtance with the common faſcia, and in this drawing the faſcia of the penis is diſſected and pinned back to the diſſecting board; the faſcia penis is marked (g).

At (h) the corpus cavernoſum ipſius urethræ ceaſes, or is not yet formed; this part of the urethra is of courſe uncovered, naked, thin, conſiſting merely of the membrane of the urethra, and thence is named the membranous part of the urethra; this is the part which bends under the pubis, and is particularly tied to the arch; it is at this bending, and conſequently at the moſt delicate and unprotected part of the urethra, that the chief, difficulty is felt in introducing the catheter; it was when the point of the catheter touched this part of the urethra, that the old ſurgeons made, what they called, the "tour de maitre" or cunning turn, for they laid the catheter with its back or convexity to the pubis, and turned it round with its concavity toward the pubis only upon arriving at this point. Whether they turned it ſo from a ſenſe of the difficulty at this point, or to conceal the manœuvre and give an air of dexterity to what they did, ſignifies little; but the cauſe of this difficulty deſerves ſome notice. It is neither the ſwelling of the bulb, the fullneſs of the corpus ſpongioſum, the oppoſition of the proſtate gland, nor any of the uſually ſuppoſed cauſes, that prevents the catheter entering the bladder; the catheter is reſiſted in conſequence of the peculiar manner in which this part of the urethra is connected with the bone; for, firſt, the arch of the pubis is filled up with a ligament which is neceſſarily of a triangular form; this triangular ligament of the pubis is perforated for tranſmitting the urethra, which paſſes actually through a hole in it; on the outſide of the ligament lies the bulb, and at this point the ſeveral muſcles, the ACCELERATOR TRANSVERSALIS-PERINÆI, SPHINCTER-ANI, and LEVATOR, are all united. The pendulous part of the bulb which is alternately ſlackened and turgid, together with the looſeneſs of the urethra on the outſide of this ligament, allows a ſort of angle here; in every caſe, even the moſt ſimple, you feel a reſiſtance when the catheter reaches this point; and when you are ſucceſsful in introducing the catheter, it ſtarts ſuddenly over this obſtruction and then ſlides eaſily along, paſſing onwards ſome way after this ſudden ſtart, before it reaches the bladder, or the urine begins to flow. The ſurgeon who is accuſtomed with the

operation, by depreſſing the handle of his catheter, raiſes the point over this obſtruction, and introduces it with a degree of eaſe: the ſurgeon, on the contrary, who ſupplies the place of addreſs by violence, and puſhes the catheter hard at this point, is ſure to drive it into the ſubſtance of the bulb, and the blood inſtantly flows from the penis in a full ſtream as from a vein; but if having puſhed it thus through the membrane of the urethra, he continues to drive it onwards by main force, he may even, with the blunt catheter, perforate the bladder as with a trocar, for the catheter paſſes out of the urethra along the perinæum and into the bladder, either through the ſubſtance of the proſtate gland, or behind it: Rude as ſuch an operation is, it has been reſorted to in caſes of extreme neceſſity, by men of the firſt celebrity.

The MEMBRANOUS PART OF THE URETHRA, marked (i), is that which lies within the pelvis, the lower extremity of this part of the urethra is embraced by the opening in the triangular ligament, and in all its length (viz. about an inch and a half) it is cloſely tied to the arch of the pubis; this is the part of the urethra which turns under the arch, and which is eaſily felt, when the catheter being introduced we paſs at the ſame time a finger into the rectum; it is the part which the lithotomiſt ſeeks out with his finger, and which he eaſily diſtinguiſhes after having made the external wound.

Immediately beyond this membranous part of the urethra, and entirely within the pelvis, lies the proſtate gland (k) of the ſize of a very large walnut, and ſomewhat of the ſame ſhape, not divided into two lobes (as the old manner of deſcribing it in the plural number, proſtates, would imply) but one continued gland, ſurrounding the urethra and neck of the bladder entirely, though far the bulkier part lies below. It lies ſo behind the pubis that it is fairly contained within the pelvis; the apex or point of the gland touches the inner ſurface of the pelvis; the lower and bulkier part is flat with ſome ſlight appearance of being divided by a rapha or ſeam into the two lobes, it is firm and even hard, ſo as to be felt diſtinctly even in its natural condition, and when diſeaſed, it is ſo ſwelled as to compreſs the outlet of the pelvis, it flattens the formed fæces, and is too diſtinctly felt by the finger to be at all miſtaken. When we cut into its ſubſtance we find it divided into many little cells full of mucus; when we cut tranſverſely we obſerve that the two ſides of the gland are divided from each other by an intermediate membrane; when, without diſſecting the gland we merely ſlit open the urethra, we obſerve the numerous ducts by which the pro-

ſtate pours its mucus into the urethra; we remark ſeven or eight ducts on each ſide, each large enough to receive the point of a briſtle; and from thoſe ducts we can, by ſqueezing the gland, preſs out the mucus very freely.

The diſeaſed proſtate reſembles a ſcrofulous gland in any other part of the body, it is white, firm, colourleſs, it ſeldom almoſt never ſupperates; the enlargement of the gland is attended with no actual pain; the diſtreſs it occaſions is from irritation, perpetual deſire to paſs urine, without the power of paſſing it but drop by drop.

This diſeaſe, frequent in the decline of life, is diſtinguiſhed by the long continued irritation, the ſmall and thready ſtream of urine, the frequent fits of ſuppreſſion, the ſlow delivery of the urine drop by drop, the ſlow but regular increaſe of the obſtruction as age advances, till after frequent ſlighter ſuppreſſions of urine the neck of the bladder at laſt inflames, the obſtruction becomes compleat, the abdomen ſwells with pain and fever, the catheter, or even the ſmalleſt bougie will not paſs.

Though falls, bruiſes, and other cauſes of inflammation do ſometimes require that we ſhould tap the bladder and continue for a time to draw off the urine by the trocar; yet this diſeaſe of the proſtate, ſo frequent in old age, is almoſt the only one in which we need to perforate the bladder, with the deſign of leaving the trocar permanently in the wound.

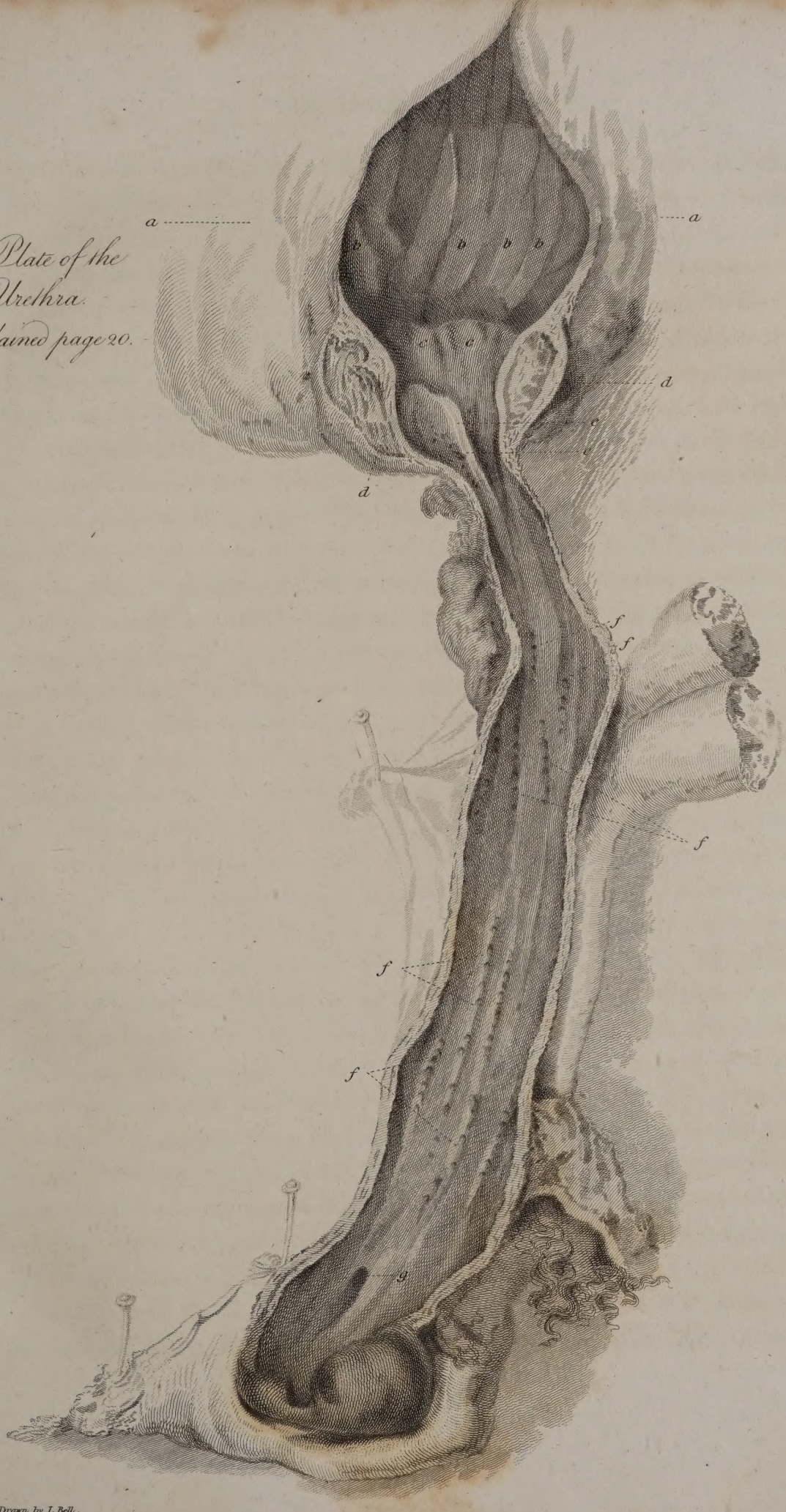
The veſiculæ ſeminales marked (k k) lie upon the lower part of the bladder, betwixt it and the rectum; the veſciculæ are very firm and ſolid; they are of a white or bluiſh colour; they conſiſt of continuous cells fifteen or twenty in number, but they are not, as they have actually been deſcribed, a continuation of the vas deferens, for the vas deferens (l l) is hard, firm, very ſmall, and enters laterally or rather obliquely into the veſicula. Whether theſe be receptacles for the ſemen ſecreted by the teſticle, or whether they be full of a peculiar liquor, is a queſtion (however important in phiſiology) of infinitely little importance in ſurgery; this only we may be allowed to obſerve, that had there not been ſuch plain and obvious receptacles for the ſemen, phiſiologiſts would probably have been at no ſmall pains to diſcover ſome reſervoir in which, after being ſecreted, it might be retained for the moment of ejaculation.

Theſe veſiculæ lie ſo obliquely upon the lower and back part of the bladder, that they leave an open ſpace at (m), where according to ſome of the old methods of lithotomy, and eſpecially in that practiſed at one time by Cheſelden, the inciſion

was made; and where, when we perforate the bladder from the rectum, the trocar is ſtruck into the bladder: In this drawing the veſiculæ, (in conſequence of the cellular ſubſtance which naturally attaches them to the bladder being diſſected away) hang ſomewhat looſe, they fall away a little from the body of the bladder, and leave rather a larger ſpace than natural bare.

But it would be in vain to deſcribe thus accurately the veſiculæ ſeminales, the bulb of the urethra and the proſtate, without giving at the ſame time, ſome idea of the ſtructure of the urethra itſelf; I have therefore interpoſed here a ſlight etched plate which I deſigned at firſt for a marginal drawing. This ſupplementary drawing marked ETCHED PLATE OF THE URETHRA, is a ſketch of the internal ſurfaces of the urethra and of the proſtate gland; it is the urethra of fig. 2d. ſlit up and ſpread out, the parts being twiſted a little ſo as to turn the veſiculæ down under the bladder in order to ſhow what is called the veru-montanum, or little eminence formed by the entrance of the ſeminal ducts. (a) Marks the external ſurface of the flaccid bladder; (b) marks the folds into which the bladder falls in this flaccid and dead or uncontracted ſtate; (c) marks the eminence which the proſtate gland makes within the bladder; (d d) marks the cut ſubſtance of the gland; (e e) marks a longiſh eminence ſomewhat reſembling the frenulum linguæ: When you ſtand before a glaſs and turn the tip of the tongue to the roof of the mouth, you obſerve a little granule of fleſh ſtanding up in the middle of the frenulum linguæ, and on each ſide of it you ſee diſtinctly two ſmall papillæ by which the two ſub-maxillary ducts open under the tongue; in like manner in looking to the little eminence (e e) you remark two very minute openings which are the openings of the ſeminal ducts or of the veſiculæ; and theſe reſembling ſomewhat the eyes while the prominence ſlightly reſembles the head and long bill of a wood-cock, is the reaſon why this little part has been named the Caput Galinaginis. This little prominence then begins near the point of the proſtate gland, and runs onwards a little way into the membranous part of the urethra; and on each ſide of it are diſtinctly ſeen ſeven or eight openings by which the mucus of the proſtate gland is diſcharged into the urethra; for I ſuſpect the proſtate to be merely a mucous gland. This Caput Galinaginis I have drawn as I ſee it in the ſubject before me, and with little of that ferocious beak and ſtaring eyes which former anatomiſts have thought fit to give it; they have laid this diſſection before the engraver, explained to him the meaning of the term Caput Gallinaginis, while he has proceeded in his drawing with a hearty reſolution of making out the veritable likeneſs of the wood-cock.

Etched Plate of the Urethra.
Explained page 20.



Drawn by I. Bell.

Engraved by E. Mitchell.

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Next to this ſucceeds the membranous or naked part of the urethra; and of the whole of this membrane it will be remarked in this drawing, that it is ſtriated with long villi or folds running according to the length of the canal; that theſe folds enable the urethra to dilate to any ſize; and that in the depths of theſe folds or longitudinal rugæ, lurk the numerous glandular openings or lacunæ; of theſe lacunæ from twelve to fifteen marked (f f), are remarkably large, and one eſpecially; about an inch under the point of the glans is one marked (g), ſo large that the point of the catheter or bougie will eaſily enter it. Theſe lacunæ which ſecrete the mucus of the urethra are the proper and peculiar ſeat of gonnorrhea, and this large one marked (g), is eſpecially affected; there are few lacunæ in the membranous part which is of courſe rarely affected, and the proſtate gland or its ducts almoſt never. I have ſeen the diſeaſe reach the neck of the bladder accompanied with a pain in the abdomen, a profuſe flow of matter and an inceſſant deſire to make water, which was torturing to the laſt degree; but this kind of iſchuria ſeemed always to me rather an affair of ſympathy and irritation, than an actual inflamation of the neck of the bladder, and when properly treated ſeldom laſts many days.

The whole of this membrane which is naturally white, is ſo tranſparent that the blood ſhines through it, whence it has a general livid colour. In the rugæ where the glands or mucous lacunæ are ſeated, the membrane has more colour, becauſe it is more vaſcular; it is ſo tender that it is eaſily torn by falls or blows, wounded by the catheter, or eroded by ulcers, ſo that the blood flows freely from the cavernous ſubſtance. When particularly inflamed the membrane begins to grow and thicken whence ariſes ſtricture, for the ſame increaſe of ſubſtance or growth which produces tumor outwardly, forms ſtricture in a hollow tube, and here the ſtricture plainly conſiſts of a growth or thickening of the walls of the urethra, the cure of which is to be expected only from a total extirpation of the part; this is generally beſt effected by cauſtic, a method of cure for the diſcovering and perfecting of which the world is infinitely indebted to John Hunter and his ſucceſſor Mr. Home.

It will be underſtood from the view of theſe rugæ and lacunæ; firſt, why the urethra is ſo eaſily elongated or dilated as in erection, or in the paſſing of the ſtream of urine; ſecondly, why erection is always attended with a flow of mucus proceeding from the compreſſion of the mucus ducts, a diſcharge which the ignorant are apt to miſtake for a ſeminal weakneſs.

The whole of the urethra ſeems to have a degree of contractile powers, which prevents the iſſuing of the urine; but there is a particular faſciculus of muſcular

fibres immediately ſurrounding the neck of the bladder, which ſerves as a ſphincter, and theſe fibres lie ſo directly under the proſtate gland, that they are named Muſculi proſtatici.

The general form of the bladder is in the ſecond drawing * correctly expreſſed; for the human bladder, as already explained, differs entirely in ſhape from that of the lower animals: The bladder in lower animals is from the inclination of their bodies, of a flaſk-like ſhape, the fundus large, and the neck ſmall and long; but in man the lower part of the bladder is very broad and large, and fills entirely the cavity of the pelvis; the lower part is not drawn out as in animals, into a long neck, but the urethra is implanted as it were upon the broad ſide of the bladder, and the proſtate gland together with the joining of the bladder with the urethra (which lies under the gland,) is the only part that can properly be named the cervix; the lower part of the bladder when compleatly inflated, ſhows two remarkable bulgings or ſacs which bulge out on each ſide of the rectum; theſe bulgings are marked (n n); the veſiculæ (k k) lie upon the lower part of theſe two lateral ſacs; the vaſa deferentia (l l) run obliquely into the veſiculæ; and behind the vaſa deferentia are the two ureters (o o) which enter the bladder about an inch behind the veſiculæ, and towards the ſide of them. (m) Is the flat part of the bladder, as formerly marked, into which we ſtrike the trocar in perforating the bladder from the rectum; while (p p) marks the part of the bladder into which the inciſion is made, when we perform the lateral operation of lithotomy, and into which the trocar is ſtruck when we tap the bladder from the perinæum, for then the operation is done by an inciſion reſembling that for the lateral operation.

Something of the ſtructure of the bladder is alſo explained in this drawing; the muſcular coat of the bladder is much talked of as a part ſuppoſed and only ſuppoſed, to exiſt, becauſe of the muſcular power which the bladder manifeſtly poſſeſſes; but the muſcular coat of the bladder is as diſtinct as the platiſma myoides or muſcular covering of the neck, and is nearly as ſtrong. In this drawing the muſcular coat of the bladder is not caricatured, but fairly and ſimply drawn, nor is this bladder diſeaſed for it is large and was in this ſubject (a ſtrong big man) perfectly tranſparent in the interſtices of theſe muſcular fibres.

The three coats of the bladder are; firſt, the peritonæal coat, which is marked (g g), while the continued membrane of the peritonæum is thrown out upon the

* We now return to the explanation of the ſecond drawing.

board marked (r); this is the part of the peritonæum which lines the abdominal muſcles and is reflected upon the bladder. This peritonæal coat reaches no lower than (s s) for all the back part of the bladder (m) is connected with the rectum by looſe cellular ſubſtance; the ſides and bulgings (p p) lie under the tuber iſchii, and are alſo connected with cellular ſubſtance, while all the forepart of the bladder where it lies againſt the pubis, is connected by looſe cellular ſubſtance with that bone.

The ſecond or muſcular coat, the DETRUSOR URINÆ is here without any art or diſſection very diſtinctly ſeen; the cellular ſubſtance is merely taken off and the muſcular faſcia appears in this back part of the bladder, and eſpecially in the hollow betwixt the two lateral ſacs, compoſed of ſtrong bands of red and fleſhy fibres, croſſing each other; and all over the ſides of the bladder the faſiculi are ſeen running in a circular direction.

This muſcular coat is ſo compleatly formed, even in a child, that upon injecting the arteries in a boy with ſize, the fleſhy fibres of the bladder take on colour ſo particularly, that the muſcle of the bladder appears of a deep red, and all its faſciculi are diſtinctly ſeen.

The third or villous coat, which lines the bladder, is a thin but firm membrane, with a ſmooth ſecreting ſurface ſimilar to the internal ſurfaces of the æſophogus or rectum; it is leſs liable to diſeaſe than the ſecond coat; the villous coat is often found where the muſcular is ſo thickened as to conſtitute diſeaſe.

The bladder is not only fleſhy, but this muſcle of the bladder is the moſt irritable in the body, and the moſt ſubject to ſympathies. Thickening of the bladder is almoſt as frequent as thickening of the ſubſtance of the heart. Of thoſe men in a regiment who are obſerved to go frequently out of the ranks, the bladder is found after death to be as ſmall (and almoſt as ſolid) as an orange; this contraction of the bladder proceeding at firſt from irritability, and confirmed by habit, increaſes as men advance in years, and is particularly frequent towards the decline of life, when the muſcular coat being thickened and the ſphincter paralyſed the powers of expulſion and of retention come to be ſo nearly balanced, that the ſlighteſt irritation cauſes a diſcharge of urine, and in courſe of time a ſtillicidium urinæ or perpetual dribbling of the urine comes on. This ſimple thickening and contracted ſtate of the bladder, though it occaſions uneaſineſs and a frequent call to diſcharge the urine, yet amounts not to diſeaſe, while the urine continues pure and tranſ-

parent; but when the urine is thickened with great quantities of mucus, and when pain accompanies the contraction, when heat does not abate the irritability; when the patient riſes frequently during the night to void his urine, and voids it with preſſure and pain, the villous coat or lining of the bladder is diſeaſed. And in this ſchirro-contracted-bladder, we find the muſcular coat on the internal ſurface remarkably faſciculated, the faſciculi croſſing each other like the meſhes of a net, while the internal ſurface is divided into innumerable cells, correſponding with the intrications of the fibres, and deep enough to receive the point of the thumb; I have in ſuch caſes ſeen the fibres thick enough to reſemble the columnæ carnæ of the auricles of the heart.

Whether the means which I have imagined for the dilatation of a bladder beginning to be thus contracted will be ſucceſsful in every caſe, I dare not pretend as yet to decide.

THE THIRD DRAWING

Shows, among other circumſtances of the anatomy of theſe parts, another muſcle the LEVATOR-ANI which equally belongs to the bladder and rectum; its office is common to both, it reſiſts the deſcent of thoſe parts when they are preſſed from above by the diaphragm. This drawing is taken from a vertical ſection of the pelvis; the haunchbone of the right ſide is torn off; the pubis and os iſchium are cut acroſs; (a) marks the ſurface of the ſacrum from which the os ilium is ſeparated; (b) marks the ſymphiſis pubis from which the penis is ſuſpended by a ligament; (c) marks the cut branch of the os pubis; (d) the ramus or branch of the os iſchium alſo cut acroſs; (e e) marks the lumbar ſpine; (f f) the tranſverſe proceſſes of the vertebræ of loins; (g) marks the os coxygis; and thus we have the limits of the pelvis indicated. The contents of the pelvis as repreſented in this view are connected as follows: (11) Firſt the line of the peritonæum ſeparates the cavity of the abdomen from that of the pelvis; ſecondly, the upper part of the bladder, covered by the peritonæum, is ſeen projecting above the cavity of the pelvis, while the lower part (h) is ſeen below the line of the peritonæum embeded in a very looſe cellular ſubſtance; thirdly is ſeen the rectum, or rather the ſygmoid flexure of the colon at that point where it makes its moſt ſudden turn at the top of the pelvis, and at (i) this inteſtine having paſſed behind the peritonæum or lining membrane of the abdomen, aſſumes the name of rectum or ſtraight gut, becauſe here it runs directly

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Third Sketch.

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down in the hollow of the ſacrum, lies juſt behind the bladder, and in contact with it, and is embeded along with it in the ſame looſe cellular ſubſtance: The gut terminates finally in the anus at (k).

Among the cellular ſubſtance of the pelvis the ſeminal ducts and ureter paſs into the bladder; firſt, the vas deferens (l) going down behind the peritonæum runs along the lower and back part of the bladder, and paſſes into the bladder, at (m) with ſo oblique a courſe that the obliquity of its entrance ſerves as a valve, and though we can inflate the bladder from the ureters, we can, after tying the urethra, preſs the air back into the ureters ſo as to empty the bladder; ſecondly, the vas deferens (n) riſes over the pubis, paſſes down along the back part of the bladder, and runs for a little way, ſide by ſide, with the veſicula ſeminalis, before it enters into it; thirdly, the veſicula ſeminalis (o), is ſeen in this diſſection, lying betwixt the bladder and rectum, the end of the veſicula only projecting from betwixt the bladder and rectum, while the head of it lies cloſe under the bladder and beneath the proſtate gland; fourthly, the blood veſſels of the pelvis lie alſo behind the peritonæum, and in the looſe cellular ſubſtance by the ſide of the rectum; the internal iliac artery (p) ſoon divides into the great trunk (g) which contains the gluteal and ſciadic arteries, and the common pudic artery (r) which ſupplies all the important parts within the pelvis, and from which the branch (s) goes to the bladder and veſiculæ ſeminales, ſpreading round the place where the ureter enters the bladder; (t) another and a larger branch paſſes under the levator-ani muſcle to the verge of the anus, and emerging there runs along the accelerator urine muſcle, and from its place on the perinæum is named the perinæal artery; while the third and main branch of the artery marked (u), goes directly to the root of the penis, and immediately plunges one branch (v) into the cellular ſubſtance of the bulb, and another at (w) into the corpus ſpongioſum penis.

But the point of this drawing which is in every ſenſe the moſt intereſting; which is both the moſt curious in reſpect to the ſtructure of theſe parts, and the moſt important for the ſurgeon to remember, is the LEVATOR-ANI, the muſcle which lines the pelvis below, cloſes the outlet, and ſerves as an antagoniſt to the diaphragm. The LEVATOR-ANI ariſes from all the borders of the thyroid hole, from the inner ſurfaces of the os pubis and os iſchium, even to the ſpinous proceſs of the iſchium; its fleſhy fibres are big and ſtrong, and lie in a converging order, for they riſe from a broad origin, and are drawn together, fan-like, into a narrow inſertion; they all converge towards the opening of the anus when they are implanted into the

Sphincter Ani. From this muſcle cloſely encircling the rectum, and from its obvious effect in raiſing the rectum, it has been named Levator Ani, and no farther inquiry made into its mechaniſm or action; but it is proper and natural to conſider its relation to all the contents of the pelvis, and to the cavity of the abdomen, in a more general way. FIRST—it is to be obſerved, that ſince it was neceſſary that the opening of the pelvis ſhould be cloſed below, ſo as to prevent protuſions of the bowels (in conſequence of gravitation and the force of reſpiration,) and as an expanded ligament could not be a proper ſupport for the viſcera, this great muſcle was formed! which, by contracting in proportion to the ſtate of the parts, ſupports them continually: SECONDLY—it was neceſſary that the pelvis ſhould be cloſed below, not merely for the ſupport of the viſcera but for the ſake of reſpiration, therefore, the Levator Ani ſince it cloſes the whole opening of the pelvis and re-acts upon the diaphragm, muſt be conſidered as an antagoniſt to the diaphragm, and as giving effect to its action as much as the abdominal muſcles; for while the abdominal muſcles cloſe the abdomen on the forepart, the levator ani cloſes the abdomen below: THIRDLY— it was eſſential to this muſcle performing its office, that no point ſhould be left open; and therefore the levator-ani mixes its fibres with thoſe of the muſcles of the perinæum, firſt it is implanted directly into the ſphincter ani, of which it is not an antagoniſt, but a part. Their actions are not oppoſite but ſynchronous; in the common acts of reſpiration and in coughing, ſneezing, &c. the emptying of the rectum is prevented by the conſtruction of the ſphincter ani, and the action of the diaphragm is counteracted by the re-action of the levator ani; but when the fæces are to be diſcharged, the ſphincter ani is relaxed ſo as to leave the end of the rectum open, and the levator ani is alſo relaxed, and no longer reſiſts the preſſure of the diaphragm, whence the anus in the paſſing of the ſtools is protruded; but when the fæces have paſſed, the ſphincter ani acts, by which the opening of the rectum is cloſed; and the levator ani is alſo reſtored to action, and reſpiration goes on in the uſual way, after being interrupted by that long inſpiration which is neceſſary in expelling the fæces.

The Levator Ani then is inſerted into the ſphincter ani, and they are as one muſcle; it alſo has a faſciculus of fibres which paſs over the membranous part of the urethra, and is implanted into the root of the bulb, ſo that the levator is particularly connected with the accelerator urinæ, or muſcle of the bulb. All the muſcles then diſplayed in this drawing, as the Levator Ani (x x x); the Sphincter Ani (y); the Accelerator Urinæ, or muſcle of the Bulb (z); are all connected as one great muſcle,

an antagoniſt to the Diaphragm. The faſciculus of the levator which proceeds from the lower part and inner ſurface of the pubis, and which in a particular manner embraces the membranous part of the urethra, and connects itſelf with the bulb I have marked with an (*), becauſe I think it particularly important for the lithotomiſt to remark this piece of mechaniſm. Let the ſurgeon obſerve then that this muſcular aparatus cloſing the pelvis below, is compleat and connected at every point; that the Levator, Sphincter, and Accelerator, are all united in the perinæum; that no opening in the muſcle is left, except as in the other abdominal muſcles, ſmall foramina for the paſſage of blood veſſels; but except the ſmall openings for the paſſage of the perinæal arteries and veins, all is cloſe here, and even the urethra does not paſs without being covered by its own muſcle, which is connected with the others. Let the ſurgeon then take notice that at the place where the line proceeding from the mark (*) terminates, is the particular faſciculus which covers the membranous part of the urethra; that at the place where the mark (*) itſelf is placed, the proſtate gland lies under the body and moſt fleſhy part of the levator muſcle; by comparing the place of the veſiculæ ſeminales (o) with the bulb of the urethra (z), he will ſee that the parts which are the aim of the lithotomiſt, viz. the membranous part of the urethra, and the proſtate gland, lie ſo covered by the levator ani, that without cutting through this muſcle, we cannot reach them; that what is called the membranous part of the urethra is not left altogether uncovered, but is to be felt naked only from within, either by putting the finger into the anus after introducing the ſtaff, (when the ſtaff will be felt as diſtinctly as if not even a membrane were interpoſed) or after the inciſions of lithotomy; for when theſe are correctly performed, when not only the ſkin is divided, but the muſcle at (*) fairly diſſected, the finger of the operator is admitted deep, he touches a point far behind the margin of the anus, and feels the membranous part of the urethra and the almoſt naked ſtaff from one ſide.

Fourthly, the relation of this muſcle to the bladder muſt be obſerved, for it is more a muſcle of the bladder than of the rectum, and all the painful ſympathies and ſtrainings of the bladder, and eſpecially the perpetual deſire to make urine in piles and other diſeaſes of the rectum, proceed from the contractions of this muſcle. From the manner in which this muſcle is wrapped round the rectum it would be natural to imagine it muſt have ſome influence in emptying the rectum, while in fact it can have none, for while the fæces are paſſing, the ſphincter is relaxed, and when the ſphincter is relaxed, the whole

levator muſcle muſt be relaxed, becauſe its fulcrum or inſortion is gone. But when the fæces have paſſed, and the ſphincter contracts, the levator ani recovers its action; and when the anus is at once cloſed and retracted, the levator compreſſes the bladder, becauſe the rectum is emptied and cloſed; and in proof of this let it be remarked, that though we cannot go to ſtool without at the ſame time paſſing our urine, we never paſs the urine and fæces at once, but ſucceſſively; firſt, the ſpincter ani is relaxed, and the ſuppreſſion of the breath and the ſtrong action of the diaphragm expels the fæces; ſecondly, the opening of the rectum is cloſed, the anus is retracted, and then the levator, reſuming its action, begins to affect the bladder; thirdly, the ſphincter of the bladder is relaxed, and the levator compreſſing all the contents of the pelvis, expells the urine ſtrongly and with ſuch irritation, that though the bladder had been previouſly and completely emptied, the laſt contractions of the levator in retracting the anus, empty the bladder even of the few drops that may remain in it.

What then is the teneſmus which is attended with ſuch an irritation and intenſe deſire to paſs urine? It is not, as uſually defined, a continual deſire to paſs the fæces, but a continual deſire to ſuppreſs this action, a continued retraction of the rectum, which is of courſe attended with a frequent action of the levator upon the bladder accompanied with perpetual irritation and deſire to make water.

THE FOURTH DRAWING

Exhibits a ſtage of the diſſection peculiarly intereſting, for the levator muſcle being diſſected, cut away from its origin and turned down, the rectum, the bladder, the proſtate gland, are diſplayed; and the connections of the membranous part of the urethra with the pubis, and the ſeveral forms and relative ſituations of the bulb, membranous part of the urethra, proſtate and veſiculæ, are completely diſplayed. This is the intereſting part of the diſſection of theſe parts, for this is the place where we meet with the chief difficulty in introducing the catheter, and at this point we make the moſt critical part of the inciſion for lithotomy.

But before I call the attention of my reader to this main point of the demonſtration, I ſhall firſt explain the ſubſidiary parts of the drawing, or in other words, the manner in which the diſſection was prepared for taking this particular view.

The ſygmoid flexure of the colon is ſeen hanging over the edge of the peritonæum ſupported by a piece of tape. The Apendices Epiploicæ which characteriſe this part of the inteſtinal canal, are ſeen at (a a); at (b b) is ſeen the edge of the perito-

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The Fourth Sketch.
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næum, where it paſſes from the back part of the bladder over the forepart of the rectum and colon; at (c c) is ſeen the cut edge of the peritonæum, where it forms the outer coat of the colon, and the nature of the peritonæal coat of the inteſtines in general may be conceived from this drawing; at (d d) the inteſtine being uncovered of its peritonæal coat, its fleſhy fibres intermixed with pelotons of fat is diſplayed; and (e e) the fat which lies under the peritonæum hangs in large maſſes.

Next we have to remark again the parts which lie properly within the cavity of the pelvis, under the peritonæum; firſt, the body of the bladder (f) with ſeveral pelotons of fat adhering to it; the Ureter entering obliquely into it at (g), and the Vas Deferens paſſing down behind it to enter into the Veſicula Seminalis at (h); below this the Rectum is ſeen at (i i), with its looſe cellular ſubſtance falling out of the pelvis, becauſe it is no longer contained and ſupported by its proper muſcle, the levator ani; and at (k) the Veſicula Seminalis is ſeen lodged betwixt the rectum and bladder.

The bones of the pelvis which appear in this ſketch are only thoſe of the pubis and iſchium; the body of the pubis is marked (l); the branch of the iſchium which is cut near its tuberoſity, is marked (m); the intermediate ſpace which is a part of the circle of the thyroid hole has ſome rags (n n) of the levator ani muſcle adhering to it; the ſymphiſis pubis, marked (o), has the root of the penis connected with it by a ſort of ligament; and the crus penis of the right ſide (p) is ſeen riſing from the branch of the iſchium, while the body of the penis, with its ſkin half diſſected and turned forwards, is ſeen lying out in the direction (g); the accelerator urinæ muſcle (r) is diſſected off from the bulb and hangs down, while the levator ani being cut away from the bones is inverted and laid down; it is marked (s) and lies over the maſs of fat which ſurrounds the anus (t), and it is the ſmooth inner ſurface of the levator ani that is here expoſed; the ſize of the muſcle and its ſtrength of fibre is beſt underſtood from the preceding drawing.

Theſe are the accompaniments of this view which is chiefly intereſting in that one point, where by the turning down of the levator ani, the gland and membranous part of the urethra is expoſed: *Firſt*, (1) marks the body of the urethra ſurrounded by its proper and peculiar cellular ſubſtance: *Secondly*, the bulb marked (2) lies in the part of the perinæum neareſt the verge of the anus: this is what is called the pendulous part of the bulb, and it ſhould be again remarked that no part of the bulb is within the cavity of the pelvis or is at all connected with the bones, it lies merely in the perinæum: *Thirdly*, it muſt be particularly noticed

that the membranous part of the urethra (3) lies directly under the middle of the arch of the pubis, and is connected with it, not merely by common cellular ſubſtance, but by paſſing through a hole in that triangular ligament, which fills the arch of the pubis: *Fourthly*, it muſt alſo be particularly noticed that the proſtate gland being behind the membranous part of the urethra, is entirely within the cavity of the pelvis, it is marked (4), and, like the membranous part of the urethra, is only to be felt after paſſing the finger within the rectum, or after having performed the inciſions for lithotomy, or for tapping the bladder; fifthly, it is to be obſerved that there is a ſpace marked (5) behind the proſtate, betwixt it and the entrance of the ureter, which is incorrectly named the neck of the bladder; for the neck of the bladder is that part which is embraced by the proſtate gland, while this part behind the gland, is truly the body of the bladder; it is the biggeſt and moſt capacious part of the bladder; it is the great lateral ſac formerly ſo particularly remarked in explaining the ſecond drawing.

Now this drawing enables me to point out at preſent, in a correct manner, the place of the ſeveral inciſions in lithotomy, and to reaſon afterwards upon the mechaniſm of theſe parts with a perfect conviction that my reader muſt underſtand me.

When Cheſſelden firſt imitated the operation of Frere Jaques, although Frere Jaques often miſſed his intended ſtroke in the body of the bladder, Cheſſelden never did ſo; he did not mangle the parts, but, by his ſkill in anatomy, cut direct into the part of the bladder marked (5): but it was an inciſion ſo deep, ſo oblique, and paſſing through ſuch looſe cellular ſubſtances, that many of his patients died of ſuppurations within the pelvis.

When Raw and Cheſſelden and other ſkilful Lithotomiſts cut with the knife, independant of any rules, or rather traditions, concerning the operation of Frere Jaques, they firſt entered their lithotome or pointed ſcalpel, into the membranous part of the urethra, and ran it directly onwards into the cavity of the bladder, through the body of the proſtate gland, uſing the knife as they would have done a lancet in opening any great abſceſs or diſeaſed ſac; this form of inciſion was very ſucceſsful.

When Sir Cæſar Hawkins invented the cutting gorget, which makes the inciſion in a lateral direction, the ſurgeon began the critical part of the inciſion, viz. that into the bladder, by firſt ſlitting up the membranous part of the urethra, marked (3), almoſt its whole length, and then introducing the beak of the gorget by that ſlit,

and running it onwards along the groove of the ſtaff into the bladder. The cutting edge of the gorget completed the internal inciſion, by paſſing through the body of the proſtate gland in the lateral direction marked (6).

This is the operation which modern ſurgeons have choſen; which of thoſe various methods ſhould be preferred will form an intereſting part of the following diſſertation; and in a ſurgical queſtion like this every argument muſt have reference to theſe ſucceſſive views of the anatomy of the parts.

But whichever operation we perform, the courſe of the great blood veſſels is particularly to be reſpected, the arteries peculiar to the penis are therefore diſſected in this view; (u) marks the trunk of the arteries belonging to the pelvis; (v) marks the poſterior iliac artery, or the great artery which turns out of the pelvis through the ſciadic hole, and ſupplies the glutæal muſcles; (w) marks the track of the Pudic artery, or the Arteria Pudica Communis, for it is the common trunk from which all the individual arteries of the private parts ariſe; (x) marks that great artery which fills the ſpongy bodies of the penis with blood, and which having reached the arch of the pubis, divides into two conſpicuous branches; firſt, (x) which is the continued trunk, and which, running up under the arch of the pelvis, enters into the crus penis, and pours its blood into the cells of the body of the penis; from this trunk a branch marked (y), rather ſmaller, curling, and about two inches in length, turns downwards and enters into the bulb of the penis, and fills the bulb and the corpus cavernoſum ipſius urethræ, and of courſe the glans, which is a continuation of it, with blood.

The Artery of the Perinæum is marked (z); it goes off from the pudic artery, where it lies under the tuberoſity of the os iſchium, runs curling along the gut, emerges betwixt the anus and the root of the penis upon the perinæum; it is this artery that is ſeen in the fifth drawing, running along the bulb; it is the artery, not of the bulb, but of its muſcles, for it gives branches to the accelerator fat and ſkin, but not to the cavity of the bulb; it is the ſuperficial artery of the perinæum.

From the view here given of theſe arteries, it might be ſuppoſed, that, in performing the inciſions of lithotomy, they could not eſcape the knife; but upon recollecting the relative ſituation of all the parts, it will be found that the arteries (x y) belonging to the root of the penis, run on the outſide of the levator ani muſcle, cloſe under the protection of the bone; that the perinæal artery (z), the only one which departs from this general courſe, runs ſuperficially upon the perinæum, and muſt be divided in cutting the muſcles, i. e. in making the part of the inciſion

which carries the finger of the operator into the great hollow by the ſide of the rectum, under the tuber iſchii. But though the perinæal artery is alway cut, it gives out but little blood, and ſoon ſhrinks. All the three arteries in fact might be cut without danger, after their diviſion; danger reſults from ſuch wounds only when the trunk of the pudic artery is divided where it runs along the inſide of the tuber iſchii, an accident which frequently happened in cutting with the biſtonri of Frere Coſme, and ſometimes it happens to the modern ſurgeon in cutting with too broad a gorget.

THE FIFTH DRAWING

Will make this piece of anatomy compleat, by demonſtrating thoſe muſcles of the perinæum, which, though leaſt important in the operation of lithotomy, have been moſt circumſtantially, though I cannot ſay moſt correctly, deſcribed.

The perinæum with its muſcles and arteries is here preſented directly to view; the muſcles are four in number, the Erector Penis, the Accelerator Urinæ, the Sphincter Ani, and the Tranſverſalis Perinæi; and the branches of the perinæal artery are two only, one running forwards along the bulb, and the other running backwards upon the ſphincter ani and cellular ſubſtance that ſurrounds it. To draw this view, the ſkin and about an inch of fat was diſſected off; then the faſcia of the perinæum (a thin ſheet of tendinous matter mixed irregularly with the cellular ſubſtance) being carefully diſſected away, diſplayed the muſcles and arteries; but in the great hollows under the tuberoſities of the iſchium, the fat cellular ſubſtance and tendinous fibres are left ſurrounding the arteries, where they emerge from the pelvis; the faſcia or general tendinous ſheath of the penis under which the anterior branch of the perinæal artery runs, is diſſected and turned to one ſide, and the penis is turned backwards over the pubis, covered by its ſkin, which is rolled back along with it. Theſe are the parts which are to be now more particularly deſcribed.

Firſt, The opening of the anus has the ſkin of the perinæum cut very cloſe round it in order to diſplay the ſphincter ani, a big, thick, and fleſhy muſcle which encircles the anus and connects itſelf with the accelerator urinæ muſcle, by a ſlip of muſcular fibres. This is the EXTERNAL or great SPHINCTER it is marked (1), and the ſlip of muſcular fibres by which it connects itſelf with the accelerator, is marked (a).

Secondly, The ACCELERATOR URINÆ AND SEMINIS, marked (2), is a very

Anatomy of the Parts. Page 33. — The Fifth Sketch.

Drawn by I. Bell. *Engraved by E. Mitchell.*

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large muſcle with ſtrong fleſhy fibres; it covers the whole length of the bulb, and is divided properly into two muſcles, by the rapha or middle ſeam of the perinæum, and the acceleratores (for they ſhould be named in the plural number) are much more diſtinct in their inſertion than in their origin; for two oppoſite ſets of oblique fibres begin in the rapha or ſeam, and, after covering the whole bulb, terminate in two diſtinct and oppoſite tendons, marked (b b), which go off obliquely from the body of the urethra to expand upon the bodies of the penis on each ſide.

Thirdly, There is another pair of muſcles belonging to the body of the penis, marked (3 3); theſe lie entirely to one ſide of the bulb and form the perinæum into a triangular ſhape; they lie fairly upon the two crura penis, and are named ERECTORES PENIS; and from their origins being in the tubera iſchii, and their inſertions in the cavernous bodies of the penis, they are often named ISCHIO-CAVERNOSI. The Erectores then ariſe by ſmall and pointed tendons from (c c), the tuberoſities of the oſſa iſchii; they are rounder in their bellies than the acceleratores which are flat; they have an almoſt equal mixture of tendinous and muſcular fibre; they are about three inches long; one half of each muſcle lies upon the bone from which it ariſes, while the other lies along the crus penis. The two erectores are implanted into the cavernous bodies of the penis, near the place where the oblique tendon of the accelerator is inſerted; the crura penis are marked (d d); the bellies of the erectores (3 3); their inſertions (e e); and the inſertions of the accelerator tendons, is marked (f f).

Fourthly, A muſcle the leaſt in ſize, but in the conſideration of the ſurgeon the moſt remarkable, is the TRANSVERSALIS PERINÆI (4 4). The tranverſe muſcles of the perinæum are well named, becauſe they paſs directly acroſs the perinæum. The accelerator is a ſuperficial muſcle, becauſe it lies upon the bulb, which is in the central and moſt prominent part of the perinæum, covered only with ſkin faſcia, and ſome more common cellular ſubſtance, while the tranverſe muſcles lie deep in the hollow under the tuber or moſt prominent part of the iſchium, embedded in that ſolid fat which ſurrounds the lower part of the rectum. Theſe tranſverſe muſcles are not eaſily found by the ſtudent in his firſt diſſections, and not always fairly cut by the lithotomiſt; they ariſe from the tuber iſchii at (c c); they lie deep, and croſs not ſo properly the perinæum itſelf as the hollow under the tuber iſchii; they are joined at their inſertions both with the ſphincter ani and with the back part of the accelerator; their relation is rather to the anus than to the penis; they raiſe

the anus after it has been protruded, and ſerve to complete that muſcular apparatus with which the pelvis is cloſed below. All theſe muſcles are neceſſarily connected with the levator ani, for the levator encircles not only the rectum and bladder but the membranous part of the urethra, and the ſphincter, levator, accelerator, urinæ, and tranſverſalis perinæi, all meet in this central point.

How and in what direction theſe muſcles are cut in lithotomy any one who knows them correctly cannot fail to underſtand, this only being premiſed, that the operation of lithotomy requires no ſlitting up of any length of the urethra; that the bulb of the urethra ſhould not be touched; that it ſhould be the aim of the operator to make his way to the neck of the bladder by the great hollow marked (g); it is a hollow under the tuberoſity of the iſchium (c), betwixt the bone and the rectum filled chiefly with fat, and from which the perinæal artery emerges. It is manifeſt that ſince the bulb is not to be cut in the operation of lithotomy, the accelerator is not to be touched with the knife; it is equally obvious that as the inciſion is to be made into the hollow under the tuber iſchii, the erector penis is as much to the outſide of the inciſion as the accelerator is to the inſide of it; and it is equally obvious that in order to cut into the hollow under the tuber iſchii, that muſcle muſt be cut acroſs, which, from its running acroſs and barring the perinæum, is named tranverſalis; and moſt of all it is to be remembered, that within this tranſverſalis muſcle, which itſelf lies very deep, covered often with two or three inches of fat, lie the ſtrong fibres of the levator ani, which muſt be diſſected before the Proſtate Gland can be diſtinctly felt, and that the deeper part of the external inciſion (that diſſection, viz. which is made by the guidance of the fore-finger after the ſimple inciſion of the ſkin) conſiſts in the diſſection of the tranſverſalis and levator muſcles, which muſcles can neither be ſeen nor even diſtinctly felt during the operation, but are to be recogniſed by the oppoſition or croſſing of the ſtrong fibres, which the ſurgeon is ſenſible of at the place where the muſcle is known to be; and by the thickneſs of parts interpoſed betwixt the finger and the proſtate gland.

It is right that a ſurgeon ſhould conſider then the muſcles which are to be cut in the operation of lithotomy, not as conſtituting a rule for operating, nor as wounds implying any peculiar danger! for it were of no conſequence, though every muſcle here enumerated were cut acroſs, and many a ſurgeon has cut his way to the neck of the bladder ſafely and ſucceſsfully without knowing through what muſcles he had made his inciſion, or that the proſtate gland was the point to which his in-

ciſions tended. The muſcles then are to be regarded not as parts in themſelves dangerous to wound, but, as marking the true courſe of the inciſion, which is perfect only when the tranſverſalis and levator muſcles are completely diſſected.

It will next be ſatisfactory for the ſurgeon to know the manner in which the perinæal artery comes out from the great hollow under the tuber iſchii; ſo that diſſecting his way into that hollow, he may not be alarmed when he ſees the jet of blood from the perinæal artery, which he knows muſt be inevitably cut; the perinæal artery, he is ſenſible, will bleed more or leſs powerfully in proportion to the ſize of his ſubject, and does not delay the extraction of the ſtone on account of the hæmorhagy from an artery which he is acquainted with and is not afraid to divide: for, as the operation goes on, the perinæal artery, which at firſt bleeds furiouſly, ſhrinks and ceaſes to bleed.

Here then I will venture to cloſe my deſcription of this piece of anatomy which contains the facts on which we are to reaſon, and the mechaniſm to which I ſhall hereafter appeal for the truth of every theoretical concluſion and the correctneſs of every rule of practice. I look upon my reader as qualified by theſe deſcriptions and drawings, to go unaſſiſted through thoſe preliminary diſſections, without performing which, it is a ſacrilege to attempt this operation upon a fellow creature. The ſtudent will, upon diſſecting the ſkin and cellular ſubſtance of the perinæum, ſee firſt the bulb of the urethra covered with the ſtrong fleſhy fibres of the accelerator muſcle; he will remark the courſe of the perinæal arteries and veins of each ſide, which he will next diſſect away along with the fat: Upon diſſecting deeper and towards the hollow under the tuber iſchii, he will find a ſecond ſtratum of cellular ſubſtance more fibrous, mixed with ſtrings of faſcia, and there he will find the tranſverſe muſcle of the perinæum: upon diſſecting ſtill deeper and feeling with his left forefinger, as he goes on, he will, among the fat of this great hollow, perceive the reſiſtance of the levator ani muſcle, for it lines the whole pelvis and covers the parts which he wiſhes next to feel: upon diſſecting through this fleſhy thickneſs, ſtill guiding the inciſion with the point of the left forefinger, he will be ſenſible of having cut through the fleſh of this muſcle by diſtinguiſhing the urethra and proſtate gland: upon laying his finger at firſt upon theſe parts, he will hardly diſtinguiſh any thing, and will be apt to miſtake the catheter for the bone; but by moving the catheter with the right hand, and feeling with the forefinger of the left, he will recognize the membranous part of the urethra (directly under the arch of the pubis and cloſe upon the bone) and through that membranous part he will feel

the catheter diſtinctly; then running the finger backwards along the catheter he will loſe that diſtinct feeling of it, becauſe the catheter is covered at that part with the proſtate gland! at firſt he hardly believes that the thickneſs he feels covering the catheter is really the gland, becauſe in the dead body the gland is often ſoft, flabby, and not firm and ſolid as might be expected; but paſſing his finger ſtill farther back he again feels the catheter diſtinctly through the thin coats of the bladder behind the gland; and then bringing his finger forwards again, he looſes the catheter and feels it again when he comes to the membranous part of the urethra; thus recogniſing all the intermediate ſpace as the thick gland concealing the catheter. Next, upon making thoſe who aſſiſt in his diſſection, preſs down the bladder from above the pubis, he will feel the tenſe bladder and the fluctuation of the water in it below, and will be ſenſible how eaſily he could ſtrike the knife into the bladder, and drawing it forwards cut through the proſtate, and perform one of the operations for lithotomy, and that by no means the moſt eaſy or common: and he will next, by diſſecting the parts out of the pelvis, and laying them on the table, recognize the parts more diſtinctly; will feel the tenſe bladder, the gland, the naked part of the urethra, once more; he will now recollect the feelings thoſe parts conveyed to him while he was diſſecting from without, by the guidance of his forefinger, and will thus learn to cut forwards deciſively to that preciſe point of the bladder which, in operating, he may chooſe to ſtrike with his knife.

To my reader I now appeal in the moſt ſerious manner, and intreat him to repeat, frequently, theſe diſſections and leſſons, whether he deſigns to become a lithotomiſt or merely to be as much acquainted as every practical ſurgeon ſhould be, with the anatomy of theſe parts. In the courſe of ſuch a methodical diſſection he will diſtinguiſh the parts more correctly than he would believe! the difficulties he may have conceived will vaniſh when he goes ſeriouſly and deliberately through this practical leſſon! while he feels the body of the bladder and the fluctuation of the water in it with the point of his finger, he will perceive that his knuckles are buried in the wound, and will thus learn how deep his inciſions muſt be in a big and luſty man, and will thence learn to perform thoſe deep inciſions with ſteadineſs and ſelf-poſſeſſion. How it is poſſible to do ſo without ſuch preliminary diſſections I do not know; and it does amaze me that any man can, for any earthly object of reputation or of preſent gain, load his mind with the guilt of undertaking this diſſection on the living body, without being ſure that he can perform it, nor without having often performed it on the dead! nor am I leſs amazed to recollect that many

believe it poſſible to learn the operation, merely by obſerving how it is performed by others; they pretend indeed to no other authority for taking the knife and gorget in their hands, than having been often preſent when the operation was performed. Let thoſe infatuated men remember the following memorable facts:

The celebrated lithotomiſt *Raw* carried the ſecret of his operation with him to the grave; he operated, during his life on 3000 patients; his operations in hoſpitals and in the private chambers of the ſick were witneſſed by hundreds and thouſands. The ſurgeons, the phyſicians, the pupils, who were preſent at the public operations of Raw, and the ſtrangers who came from all countries to ſee him, were anxious to learn how he operated, but in vain! he foiled them in all their more ſubtile attempts, to diſcover what parts he cut, and to their direct inquiries his only anſwer was "legite Celſum." So little can the man who only ſees the outſide flouriſhes of an operator, know what he is doing with his knife or finger among the parts.

Dennis, who declares himſelf to have been the amanuenſis, the friend, the familiar companion of Raw, the perſon who accompanied him in his operations, and who alone had any ſhare of his confidence, acknowledges that he had endeavoured in vain to learn how the operation was performed, which Raw finally revealed to him on his death-bed.

Magna cum ſedulitate, quam continuus fere ipſi eſſem comes et amanuenſis, ſubtilitatem artis videndo didiceram adeo ut credidiſſem hiſce artis me factum peritum; ſed deceptus fuiſſem magnopere niſi clariſſimus vir ultimis ſui morbi horis velum ab oculis abſtuliſſet et myſteria vera artis revelaſſet. Fateor me ſaepe clariſſimum virum lithotomiam inſtituentem, opuſque nullo negotio perficientem vidiſſe, tumque cogitaſſe, me illam chirurgiam quoque ſuſcipere auſurum fore, ſed adfui quoque, ubi difficillime perficeretur, ſummam que ipſe artem et ſapientiam adhiberet, et nunquam me ſuſcepturum opus ſtatuebam. *Stupebam, et horrebam me vanæ huc uſque meæ opinioni plauſiſſe* cum audiſſem, quænam mihi adhuc defeciſſent, ſi prima fretus opinione in artis exercitio perrixiſſem. *Fateor ingenue me multos ægros infelices redituram fuiſſe, et ſi unquam felices habuiſſem ſucceſſus id magis caſui, quam arti et ſcientiae fuiſſet tribuendum.*

"I had" ſays Dennis, "ſo often ſeen this illuſtrious man performing his operation with compoſure and eaſe, that I vainly ſaid within myſelf, ſurely I alſo can perform this operation; but when at other times I have ſeen him engaged in ſuch difficulties as required all his ſkill and wiſdom, I have vowed that I never

ſhould engage in any ſuch attempt. And when with his laſt breath he revealed to me the true method of performing the operation, I was ſtruck with remorſe and horror at my own vain thoughts: had I yielded to thoſe ſuggeſtions, many muſt have been the victims of my raſhneſs, and I could have been ſucceſsful only by chance."

Hear theſe confeſſions and tremble! let no man ever ſay again, "I can perform lithotomy, for I have ſeen it many times performed."

THE

OPERATION OF LITHOTOMY.

SECTION II.

Containing Biographical, Critical, and Hiſtorical, Sketches of the moſt famous Lithotomiſts, and of their Operations.

FIRST, OF THE APPARATUS MINOR, OR OPERATION OF CELSUS.

SUCH is the intereſt that men in all ages have taken in the ſucceſs of this operation, that the various methods in which it has been performed have been faithfully recorded.

The hiſtory which I am about to lay before my reader is, I believe, full of amuſement and inſtruction. Princes and parliaments have taken a direct concern in every thing that related to the improvement of lithotomy; and ſocieties and convocations of learned men have endeavoured to improve the operation, while individual phyſicians labouring under the tortures of the ſtone, have undertaken deliberate experiments and diſſections, and (looking forward to what they were themſelves to ſuffer) have taught bold but unſkilful men how to perform the operation with all the precautions which ſcience and the ſtudy of anatomy could ſuggeſt: even a ſlight ſketch of ſuch a hiſtory muſt be gratifying; but it is more, it is uſeful, it is eſſential to the young ſurgeon whoſe conceptions concerning this curious piece of diſſection, are not eaſily acquired! he muſt not only diſſect the parts but ſtudy the authors who have written on this operation. That ſurgeon ſurely would perform his operation with little confidence or courage (and it is one which

requires much of both) who were ignorant of the hiſtory of the operation which he is to perform; of the men learned or unlearned, by whom it was invented; of the ſurgeons rude or ſkilful in diſſections by whom it has been improved.

It is now ſuppoſed that the operation of lithotomy is reduced to ſuch perfect ſimplicity, that it may be as well performed by the ignorant as by the ſkilful: woe to him that truſts to this ſimplicity, this mechanical correctneſs. For if a thing ſo paradoxical were to be believed, we might burn our books, forſwear diſſections, and ſtudy merely a few plain rules for guiding the gorget along the ſtaff. Would this be teaching the operation of lithotomy? no, ſurely, men perform this ſimple operation with the gorget ill, chiefly becauſe they know no other! He will ſurely acquit himſelf beſt in driving the gorget into the bladder, who knows how to cut ſafely with the more ſimple apparatus of a knife and a ſtaff.

Before anatomy was ſtudied or more curious operations invented, men were cut for the ſtone, and, as might naturally be ſuppoſed, by a method very plain and ſimple. The ſtone in the earlier times of ſurgery was diſcovered, not by introducing a ſtaff, but by feeling it from the rectum with the fingers; and no ſooner was it remarked that the ſtone, the cauſe of ſuch excruciating tortures, could be diſcovered by the fingers and preſſed from within againſt the perinæum; than the idea naturally preſented itſelf of cutting the intermediate parts with a razor and extracting the ſtone with a hook. This operation, from the uſe made of the fingers in preſſing down and holding the ſtone, was named cutting by the Gripe, in contradiſtinction to the modern operation of cutting upon the ſtaff: and when in after ages, more complicated operations were invented and various inſtruments uſed, this was named the apparatus minor or leſſer apparatus, from its being performed with no other inſtruments than a knife and a hook.

This was the operation naturally reſorted to in early ages by a people not ſkilful in anatomy, nor fearful of future conſequences, and anxious only about extracting the ſtone; it has been all along the favoured operation of quacks, whoſe want of education excluded them from all knowledge of better operations, and whoſe chief ambition has been ſafely or unſafely to extract the ſtone. But it has alſo been the favourite operation of men the moſt eminent in our profeſſion, whoſe opinions claim reſpect, and who were not wanting in learning or ſkill, to compare this operation with others, and to do it every juſtice in the execution. Let me alſo confeſs that a predeliction for this ſimple and ancient method of operating, inclines me to deliver the hiſtory of it faithfully from the earlieſt times: Let it not be

regarded as any objection to this method that it is fit to be practiſed only in boys! for that is its chief excellence. In operating on a grown man, a voluntary ſufferer, who reſigns himſelf to the operation of lithotomy, although aware of all its dangers, in whom the parts being large, the inciſions are made freely and the bladder preſents itſelf fairly to the ſtroke of the gorget! we may with leſs reluctance and with leſs danger drive the gorget along the ſtaff: but if, as I ſincerely believe, this operation by the leſſer apparatus can ſave us from the cruel neceſſity of driving the gorget with unrelenting hand among the viſcera of a child, where the parts are ſmall and the opening narrow; if this method of the apparatus minor be alſo a ſimple, eaſy, ſucceſsful, unexceptionable, operation; if it have fallen into diſuſe merely through lapſe of time, and the death of thoſe who were uſed to perform it, and from the diſrepute into which itinerate operators are now fallen, with whom it was the favourite operation! what I have to ſay in its favour muſt be deſerving of the attention of profeſſional men: Thoſe who have ſeen the gorget driven with unrelenting and horrible violence into the narrow pelvis of a child, will read the hiſtory of the apparatus minor with no ordinary degree of pleaſure.

Beſides theſe names of apparatus minor and cutting upon the gripe, this particular method was diſtinguiſhed by that of the Lithotomia Celſiana, from the elegant deſcription given of it by *Celſus* who ſpeaks of it in theſe terms: "Since I have, in deſcribing the introduction of the catheter, mentioned the bladder of urine and the ſtone, the occaſion ſeems to require that I ſhould deſcribe that operation, which, when all other methods fail, muſt be performed on thoſe who are afflicted with the ſtone: an operation which, ſince it is full of danger, muſt never be raſhly performed, nor at all times and ſeaſons, nor in all ages, nor in all degrees of the malady! but only in the ſpring, in boys from nine to fourteen years of age, and where the diſeaſe is ſo deſperate that it can neither be cured, nor even alleviated by medicine, but where the perſon muſt die in a little while. Therefore when it is reſolved to try this only chance, let the body be prepared, for ſome days, by a due regimen, by moderate diet, by avoiding heavy meats, by drinking water alone; and during this term of preparation let the patient walk about, that the ſtone may deſcend towards the neck of the bladder, which will be known by introducing the fingers after the manner I ſhall preſently mention in deſcribing the operation: When thus aſſured that the ſtone has fallen down, the boy being made to faſt for one day, the operation muſt be performed in a warm place according to the following rules."

" A ſtrong man accuſtomed with operations, being ſeated on a high chair, takes the boy in his arms, the boy's back inclining in a ſupine poſture upon the aſſiſtant's breaſt, his hips reſting upon the aſſiſtant's knees; his legs being then drawn up and his arms paſſed round his hams, the aſſiſtant takes hold of them and keeps the boy firm in this poſture. But where the lad is grown up and ſtrong, two men muſt ſit on two chairs ſide by ſide, the chairs and the thighs of the aſſiſtants where they touch each other being tied faſt together; when, the boy being ſeated on their two knees thus joined, each takes hold of the arm and leg next him, holding by the hand of the boy and pulling back his hams; and whether one or two aſſiſtants hold the boy, his ſhoulders muſt be ſteadily held down by leaning hard upon them with the breaſt. By this extenſion of the thighs the region of the pelvis is ſpread out without folds or wrinkles, while the bladder is ſo compreſſed as to make it eaſy to reach the ſtone; by the ſides of thoſe who immediately ſupport the boy, there are placed two ſtrong aſſiſtants, who ſteady them and keep them down to their ſeats." *

" Then the phyſician, having pared his nails carefully, inſinuates two fingers, the fore and mid fingers of the left hand gently, one after another, into the anus; ſpreading at the ſame moment the fingers of the left hand over the lower part of the abdomen, to prevent the neceſſity of hooking his fingers too rudely round the ſtone, by which the bladder might be injured. And this muſt by no means be raſhly done, as too frequent it is, but with all poſſible prudence, for a hurt of the bladder in that way may bring on convulſions and death: Firſt of all let the ſtone be ſought for at the neck of the bladder, where if it be diſcovered, it is more eaſily turned out through the wound; for unleſs the ſtone be thus diſtinctly known by its proper marks, the operation ſhould not be attempted. But if the ſtone either be not at the neck of the bladder, or have receded from it, the fingers muſt be puſhed deeper towards the bottom of the bladder, and the right hand alſo being carried behind the ſtone, muſt help to work it forwards; and when the ſtone

* " Medicus deinde, diligenter unguinibus circumcifis, atque ſiniſtra manu duos ejus digitos, indicem et medium, leviter prius unum deinde alterum in anum ejus demittit; dextræque digitos ſuper imum abdomen leviter imponit; *ne, ſi utrinque digiti circa calculum vehementer concurrerint, veſicam lædant.* Neque vero feſtinanter in hac re, ut in pleriſque, agendum eſt; ſed ita, ut quam maxime id tuto fiat. Nam læſa veſica nervorum diſtentiones cum periculo mortis excitat. Ac primum circa cervicem quæritur calculus; ibi repertus, minore negotio expellitur. Et ideo dixi, ne curandum quidem, niſi cum hoc indiciis ſuis cognitum eſt. Si vero aut ibi non fuit, aut receſſit retro, digiti ad ultimam veſicam dantur; paulatimque dextra quoque manus ejus

is within the gripe it muſt be the more cautiouſly and carefully handled in proportion as it is ſmall and ſmooth ; for a ſmall and ſmooth ſtone is apt to ſlip back, and to occaſion much handling and tormenting of the bladder. For theſe reaſons the fingers of the right hand are preſſed in behind the ſtone, while with the fingers of the left hand it is wrought downwards to the neck of the bladder. If the ſtone be oblong, let it be preſented, lying along with one end turned towards the wound ; if flat, with one edge towards the wound ; if ſquare, reſting upon two of its angles ; if bigger towards one end, let the ſmaller end be preſented to the wound. Whereas when the ſtone is round, there can, from the figure of the ſtone, be no difference in which poſture it is preſented ; but from its roughneſs there may ; if in a rough ſtone there be one ſmooth part, let that part come foremoſt."

" Matters being thus prepared, the inciſion is to be made through the ſkin down to the neck of the bladder, of a lunated form, not far from the anus, and with the horns of this lunated inciſion looking towards the hips. Then, in the deeper and narrower part of the wound, is to be made a ſecond inciſion, alſo tranſverſe, into the neck of the bladder itſelf, till the flowing out of the urine ſhows the inciſion to exceed in ſome degree the ſize of the ſtone : Thoſe, who for fear of fiſtulas (which the Greeks call Uriades) make their inciſion too ſmall, fall another way into the ſame or a greater danger ; for the ſtone, being thruſt ſtrongly forwards into the wound, muſt force an opening where it does not find one ſufficient for its exit, a thing eſpecially dangerous when the ſtone is rough or of an unfavourable form, for thence ariſe ſometimes hæmorhages or convulſions of the nerves, which although the patient may eſcape, yet the fiſtula muſt be much wider, when produced by laceration of the neck of the bladder, than by inciſion."

ultra tranſlata ſubſequitur. Atque, ubi repertus eſt calculus (qui neceſſe eſt in manus incidat) eo curioſius deducitur, quo minor læviorque eſt ; ne effugiat, id eſt, ne ſæpius agitanda veſica ſit. Ergo ultra calculum dextra ſemper manus ejus opponitur ; ſiniſtræ digiti enim compellunt deorſum, donec ad cervicem pervenitur. In quam, ſi oblongus eſt, ſic compellendus eſt, ut pronus : ſi planus, ſic, ut tranſverſus ſit : ſi quadratus, ut duobus angulis ſedeat : ſi altera parte plenior, ſic, ut prius ea, qua tenuior ſit, evadat. In rotundo nihil intereſſe, ex ipſa figura patet ; niſi, ſi lævior altera parte eſt, ut ea antecedat.

" Cum jam eo venit, incidi ſuper veſicæ cervicem, juxta anum cutis plaga lunata uſque ad cervicem veſicæ debeat, *cornibus ad coxas ſpectantibus paulum :* deinde ea parte, qua ſtrictior *ima* plaga eſt, etiamnum ſub cute, *altera tranſverſa plaga facienda eſt*, qua cervix aperiatur : *donec urinæ iter pateat ſic, ut plaga paulo major, quam calculus ſit.* Nam, qui metu fiſtulæ (quam illo loco ἐξιλάδης Græci vocant) parum patefaciunt, cum majore periculo eodem revolvuntur : quia calculus iter, cum vi promitur, facit, niſi accipit, idque etiam perniciosius eſt ; ſi figura quoque calculi, vel aſpritudo aliquid eo contulit. Ex quo et ſanguinis profuſio, et diſtentio nervorum fieri poteſt, *quæ ſi quis evaſit, multo tamen patentiorem fiſtulam habiturus eſt rupta cervice, quam habuiſſet,*

" The neck of the bladder being thus opened, the ſtone itſelf comes into view, which, if ſmall, is to be got out with the fingers alone, the fingers of the left hand puſhing it forward from within, while the fingers of the right hand help to pick it out: but if it be larger, a hook, made on purpoſe, muſt be ſlipped in behind it, the ſlender extremity of the hook ſhould be flattened and bent into a ſemicircular form, ſmooth on its back part, where it preſſes againſt the parts, and rough within where it touches the ſtone; and it ſhould be rather long, for a ſhorter hook has little power."

" When the hook is fixed behind the ſtone, it muſt be moved from ſide to ſide, to work the ſtone forwards; for the ſtone, if it be fairly catched by the hook, moves along with it: whereas, if you merely preſs upon the ſtone without moving it thus from ſide to ſide, it will ſlip, it will eſcape again into the bladder, and the point of the hook will ſtrike againſt the edges of the wound, the danger of which we have already explained. Having ſecured a fair hold of the ſtone, you are to perform, at one moment, three ſeveral motions, viz. from one ſide to the other and directly forwards, but all quietly, taking care firſt to draw the ſtone a little downwards. Finally, the handle of the hook muſt be raiſed, that the lower end may paſs deeper behind the ſtone which may then be more eaſily protruded. The ſtone, if it be not eaſily catched from above, may be extracted by ſlipping in the hook at one ſide."

——"Hæc eſt ſimpliciſſima curatio."—This then is the priſtine operation deſcribed by Celſus, with much ſimplicity and plainneſs; nor would I purſue his narrative one word farther than this natural cloſe, were it not to ſay, that Celſus in perfect conſiſtency with the above doctrine of the dangers ariſing from much violence or a narrow wound, orders the ſtone to be divided when too large to paſs without

inciſa. Cum vero patefacta eſt, in conſpectum calculus venit: in cujus corpore nullum diſcrimem eſt. Ipſe, ſi exiguus eſt, digitis ab altera parte propelli, ab altera protrahi poteſt. Si major, injiciendus a ſuperiore ei parte uncus eſt, ejus rei cauſa factus. Is eſt ad extremum tenuis, in ſemicirculi ſpeciem retuſæ latitudinis; ab exteriori parte lævis, qua corpori jungitur; ab interiori aſper, qua calculum attingit. Iſque longior potius eſſe debet: nam brevis extrahendi vim habet. *Ubi injectus eſt, in utrunque latus inclinandus eſt, ut appareat calculus, et teneatur, quia ſi apprehenſus eſt, ille ſimul inclinatur.* Ideoque eo minime opus eſt, ne, cum adduci uncus cœperit, calculus intus effugiat, hic in oram vulneris incidat, eamque convulneret. In qua re, quod periculum eſſet, jam ſupra prepoſui. Ubi ſatis teneri calculum patet, eodem pene momento triplex motus adhibendus eſt: in utrunque latus; deinde extra, ſic tamen, ut leniter id fiat, paulumque primo calculus attrahatur: quo facto, attollendus uncus extremus eſt, uti intus magis maneat, faciliuſque illum producat. Quod ſi aliquando a ſuperiore parte calculus parum commode comprehendatur, a latere erit apprehendendus. Hæc eſt ſimpliciſſima curatio."

injuring the parts. He ſays, * "When at any time the ſtone is too large to be extracted without laceration of the neck of the bladder, it is to be broken; an operation certainly invented by Ammonius, whence he was named Lithotomus, or the Cutter of Stones. The operation is to be performed after the following manner: A hook is to be ſo inſinuated behind the ſtone as to reſiſt and prevent its recoiling into the bladder, even when ſtruck; then an iron inſtrument is uſed, of conſiderable thickneſs, but flattened towards the end, thin but blunt; which being placed againſt the ſtone and ſtruck on the farther end, cleaves it; care being taken at the ſame time that neither the fragments of the ſtone fall back into the bladder, nor the bladder itſelf be injured by the inſtruments."

COMMENTARY ON CELSUS.

This, being the earlieſt record now in exiſtence, deſerves our particular notice: it cannot indeed be in all points correct, ſince it is doubtful whether Celſus was a phyſician, or ever took any direct ſhare in the practice of our profeſſion; aſſuredly he was not a ſurgeon, and leaſt of all a lithotomiſt, for the operation of lithotomy was interdicted to all but thoſe whoſe peculiar profeſſion it was to perform it. Celſus knew the operation only as a part of the ſcience of medicine; he deſcribes it in ſuch terms as a ſpectator would naturally uſe, and he makes indeed a ſort of apology for deſcribing an operation ſo peculiar and ſo foreign to the general plan of his writings. † "But ſince I have, in deſcribing the introduction of the catheter, mentioned the bladder of urine and the ſtone, it is natural to deſcribe that operation which, when all other methods fail, muſt be had recourſe to by thoſe who are afflicted with the ſtone."

Many of his remarks on the ſeveral points of the operation, and all his directions

* "Si quando autem is major non videtur, niſi rupta cervice, extrahi poſſe, findendus eſt, cujus repertor Ammonius, ob id λιθοτόμος cognominatus eſt. In hoc modo fit. Uncus injicitur calculo ſic, ut facile eum concuſſum quoque teneat, ne is retro revolvatur: tum ferramentum adhibetur craſſitudinis modicæ, prima parte tenui, ſed retuſa, quod admotum calculum, et ex altera parte ictum, findit; magna cura habita, ne aut ipſam veſicam per ferramentum perveniat, aut calculi fractura ne quid incidat."

† "Cum veſicæ vero, calculique facta mentio ſit; locus ipſe exigere videtur, ut ſubjiciam, quæ curatio calculoſis, cum aliter ſuccurri non poteſt, adhibeatur."

concerning the after-treatment of the patient, beſpeak him a moſt attentive and curious obſerver of whatever was done by the lithotomiſts. He allows the blood to flow freely during the operation, to leſſen the riſk of inflammation: He lays the patient on his back with the head low and the hips raiſed, covering the wound with cloths dipped in cool vinegar, and two hours after the operation, immerſes him in a bath of hot water, which, as he lies ſupine, covers him all over from the knees to the navel; in this bath the patient was allowed to remain till he began to faint. The patient being then taken out of the bath was anointed with oil, and handfulls of plucked wool dipt in warm oil, were applied to the pelvis, and hips, and groins, and to the wound itſelf. Warm poultices he condemns as more injurious by their weight than uſeful by their heat, "plus pondere nocent quam calore proficiunt." Nor does he allow the ſlighteſt bandage to be applied. But what proves more particularly that Celſus was familiar with all that is uſually done by lithotomiſts is, that he marks correctly the ſigns of extravaſated blood, and directs how it is to be removed; for, * "If," ſays Celſus, "there is on the following day a difficulty of breathing, a retention of urine, and an intumeſcence of the lower part of the abdomen, it is plain that blood is coagulated in the cavity of the bladder; then the fingers are to be introduced, the bladder is to be gently handled, and whatever clots are there, being thus broken down, will be ſpontaneouſly diſcharged. If this fail, an injection of vinegar and water is to be thrown into the cavity of the bladder, which is another way of diſſolving clots of blood."

Theſe things could not have been reduced thus to ſyſtem, unleſs the operation had been long known and daily practiſed; nor could they have been thus correctly detailed by Celſus, but from the information of profeſſed lithotomiſts. It would be extraordinary indeed if a writer like Celſus were really ambiguous in all the moſt intereſting paſſages of this deſcription; this has been confidently affirmed, but I ſhould aſcribe the doubts among commentators, rather to their own ſubtility, than to the difficulties of the text; it is plain that they miſcarried for want of knowledge! they imagined a claſſical education ſufficient for the read-

* "Proximo die, ſi ſpiritus difficilius redditur, ſi urina non excedit, ſi locus circa pubem mature intumuit, ſcire licet, in veſica ſanguinem concretum remanſiſſe. Igitur, demiſſis eodem modo digitis, leniter pertractanda veſica eſt, et diſcutienda, ſi qua coierunt: quo fit, ut per vulnus poſtea procedant. Non alienum etiam eſt, oriculario clyſtere acetum nitro mixtum per plagam in veſicam compellere, nam ſic quoque diſcutiuntur, ſi qua cruenta coierunt."

ing of Celſus! the tranſlators of Celſus have been phyſicians ignorant of ſurgery, and ignorant, of courſe, of the technical peculiarities of the language in which thoſe diſputed paſſages are written.

One expreſſion, the "plaga tranſverſa" has greatly perplexed tranſlators, though the ſenſe is very plain. The inciſion made by Celſus croſſed the centre of the perinæum, and was in all reſpects tranſverſe with regard to the bladder as well as to the external parts: "A lunated inciſion is to be made down to the neck of the bladder, with the horns looking towards the hips; and there, in the deepeſt and narroweſt part of the wound, is to be made a ſecond tranſverſe inciſion into the neck of the bladder itſelf." The inciſion of Celſus then was lunated and could not be at once lunated and longitudinal. Secondly, the horns of this lunated inciſion pointed to two correſponding parts, call them the two hips, or the two thighs, which you pleaſe; now had the inciſion not been, in every ſenſe of the word, tranſverſe, its horns could not have pointed to the two correſponding parts, but to the pubis and anus.

Thirdly, The deep inciſion is deſcribed in theſe words: "Altera tranſverſa plaga," a ſecond tranſverſe wound, which expreſsly implies, that this ſecond wound is to be a tranverſe wound, and theſe words are at the ſame time as definite and relative a deſcription of the firſt as of the ſecond wound. Fourthly, the ſame preciſe expreſſions are uſed by Celſus in deſcribing the operation on women: "For women," ſays Celſus, "on account of the ſhortneſs and wideneſs of their urethra, paſs the ſmaller ſtones; yet, when the ſtone is large, the ſame inciſions are required as in men. In virgins the fingers are to be introduced into the rectum, as in boys, for the purpoſe of holding down the ſtone; but in married women the fingers are to be paſſed into the vagina: in virgins the inciſion is to be made on the left ſide of the labium, in married women it is to be made betwixt the meatus urinarius and the os pubis; *in both, the inciſion is to be tranſverſe*, nor is there any reaſon to be alarmed, although, in women, there ſhould be a profuſe hæmorrhage."

The inciſion in women, as in men, was made on the perinæum. "Tum virgini quidem, ſub ima ſiniſteriore ora, mulieri vero inter urinæ iter et os pubis, incidendum eſt, ſic ut utroque loco plaga tranſverſa ſit." Both in virgins and in married women the inciſion was tranſverſe, and the variation in the preciſe place of the wound was obviouſly regulated by the ſtate of the parts;

in virgins it was below the vagina, becauſe of the vagina being as yet undilated, but it was within the vagina in married women, betwixt the urethra and the pubis *.

There is one paſſage of Celſus which might have ſerved as a leſſon for all ſucceeding ages, and as an authority (for they have proceeded ſolely upon authority) for making thoſe free inciſions on which the fate of the patient ſo much depends. "Thoſe who for fear of fiſtulas *make their inciſions too ſmall*, fall another way into the ſame or a greater danger, for the ſtone, being thruſt ſtrongly forwards into the wound, muſt force that degree of opening which it does not find; and this is eſpecially dangerous when the ſtone is rough or of an unfavourable form, for thence ariſe, ſometimes hæmorrhages, ſometimes convulſions of the nerves, which even although the patient ſhould eſcape, yet there is greater danger from *laceration than from inciſion.*" The words of Celſus are indeed very memorable; and though in the dead, as in the living languages, the quaintneſs of the antitheſis is not always to be received as a proof that the maxim is ſound; although in modelling the ſentence into this alliterative form, the ſenſe is exaggerated and truth and correctneſs ſacrificed to ſound; yet in ſcience, as in morals, there are certain important axioms which ſhould be thus enforced; for the moſt poſitive affirmation, or the moſt logical proof, could not give to any important maxim ſo ſtrong a hold of the reaſon and memory as the correct oppoſition of two ſimple words. It is therefore much to be lamented that this particular maxim has not been remembered in the very words of Celſus: "Multo tamen patentiorem fiſtulam habiturus *eſt rupta cervice quam inciſa.*"

And I hope that my reminding the profeſſion of this old and well proved maxim will prevent, in future, thoſe long and murderous operations, where the ſurgeon labours for an hour in extracting the ſtone, to the inevitable deſtruction of the patient.

* "*De Calculis fœminarum.*

"Hæ vero curationes in fœminis quoque ſimiles ſunt; de quibus parum, proprie tamen quædam dicenda ſunt. Siquidem in his, ubi parvulus calculus eſt, ſcalpellus ſupervacuus eſt; quia is urinam in cervicem non compellit, quæ et brevior, quam in maribus, et laxior eſt. Ergo et per ſe ſæpe excidit, et, ſi in primo, quod eſt anguſtius, inhæret, eodem tamen unco ſine ulla noxa educitur. At in majoribus calculis neceſſaria eadem curatio eſt. Sed virgini ſubjici digiti tanquam maſculo, mulieri per naturalia ejus debent. Tum, virgini quidem, ſub ima ſiniſteriore ora: mulieri vero, inter urinæ iter et os pubis, incidendum eſt ſic, ut utroque loco plaga tranſverſa ſit, neque terreri convenit, ſi plus ex muliebri corpore ſanguinis profluit."

Science, like hiſtory, has its fabulous and dark ages, in which things atchieved by the moſt ſimple means ſeem wonderful, and arts at one period generally known, ſometimes fall into oblivion! ſo it was in regard to this operation, which, after being performed by Meges and Ammonius, (near the times of Hippocrates,) and deſcribed as a ſpectator by Celſus, came at laſt to be entirely neglected and forgotten by men of ſcience, and to be practiſed only by quacks. The diſtance indeed is never great betwixt that period in which men, under the title of Lithotomiſts, Herniary ſurgeons, or other titles, claim certain operations as peculiarly their own, and quackery, or thoſe arts and deceptions by which ſuch claims are maintained. During many centuries, quacks were, in regard to hernia, fiſtula, and various diſeaſes, the chief operators, and they were the only lithotomiſts. Though ſuch operators were contemned by the learned, they were the idols of the vulgar; many among them operated to admiration, and one eſpecially had the honour of attracting, in a peculiar manner, the malignity of the profeſſion.

This was Le Raoues, a lithotomiſt, who operated about a hundred years ago in the principal cities in the ſouth of France. He practiſed a method not expreſsly known to Van Horne, who only mentions the wonders this man was reported to perform, as an incitement to others to diſcover and practiſe his way of cutting for the ſtone.

"I muſt not in this place neglect," ſays Van Horne, "to mention what was reported to me ſix months ago, by a nobleman, who had not only witneſſed in others, but experienced in his own perſon, the happy talents of one Raoues, a lithotomiſt, of Niſmes in France, who cuts men of all ages with ſingular addreſs, without the uſual ligatures, without other apparatus than a knife and hook, placing the patient merely on the knees of his aſſiſtant. For he is very ſkilful in catching the ſtone with his fingers, and preſſing it ſo againſt the perinæum, that, upon making a ſlight inciſion, the ſtone ſtarts out of its own accord: nor is this all, for after the inciſion there is no hæmorrhagy, nor does there paſs even one drop of urine by the wound: which is eaſily explained; for the inciſions of the ſkin, and of the internal wound, do not correſpond; and, incredible as it may appear, the parts are healed in five or ſix days; ſo that on the ninth day this nobleman walked round the city with his operator. Satisfied of this fact, not by report, but by being in a manner a ſpectator of what was performed on this nobleman, I hold it

right to relate the whole, that it may incite others to learn and practiſe this method *."

The beſt and moſt learned men of that age have ſpoken with enthuſiaſm of the operations of Le Raoues. Roonhuyſen, in his Caſes, tranſlated into Engliſh in the year 1676, ſpeaks of this operator in the following terms: "At this very time we underſtand, both by letters and from patients, ſomething very conſiderable touching a new contrivance *of cutting the ſtone*, practiſed in *France*, at *Bourdeaux*, by a lithotomiſt called *Raoues de Chaſtres*, now dwelling at *Niſmes*, uſed both upon old and young, and that after a quite other manner than hath been practiſed hitherto. For after that the patient hath been ſounded and felt by the artiſt, after his own way, without any body's being preſent, he then, together with the patient, walks for half an hour in his chamber, and then puts him in his ſervant's lap, who holds the patient's legs without tying him, and the maſter uſeth no other inſtrument but a little crooked knife, and no bands; nor doth he uſe any force in preſſing the belly, in lifting it up or the like, thereby to get the ſtone between his fingers. It is alſo done with leſs trouble and danger, without as much as obſerving the ſeaſon of the year, the temperament of the patient, or his age. He only thruſts two fingers into his fundament, ſo as to get the ſtone; which having compaſſed with little pain, he conveys it to the *os iſchium* as far as he can, and then a little higher, making an inciſion with his little crooked knife, of the uſual bigneſs, but ſomewhat higher and obliquely, beginning from the ſide of the ſaid *os iſchium*, and ſo continuing to the *perinæum;* which inciſion or opening is more (in that place) according to the grain of the fibres, as will be found if viewed attentively. Now

* Non debeo hic reticere, ante ſemi-annum circiter narratum mihi fuiſſe à generoſo viro, qui ipſe in aliis viderat, et in ſemetipſo expertus erat felicitatem operatoris Nemauſenſis Galli, nomine Raoues, qui ſingulari dexteritate cujuſcunque ætatis homines ſecat quàm facillime et à calculo liberat, citra inſtitutam ægri ligaturam, ſolummodo eum imponendo genubus ſui famuli, aut citra ullam inſtrumentorum opem, niſi ſolius cultri ſive novaculæ. Nam callet exacte modum, miniſterio digitorum, etiam in adultis, calculum attingere et ad perinæum ita propellere, ut facta levi inciſione, calculus ipſe ſponte ſua proſiliat: neque hoc ſolum, ſed, peracta jam ſectione, nullus ſanguinis fluxus, nihil urinæ, per vulnus exit, cujus hæc ratio eſt quia labia vulneris cuta carnis & veſicæ, adamuſſim ſibi non reſpondent: imò, quod fidem omnem ſuperat, quinque aut ſex dierum ſpatio vulnus conſolidatur, *ut nono die ipſe generoſus urbem cum ſuo lithotomo circumambulaverit. Quod non auritus tantum teſtis, ſed penè oculatus in illo viro, qui in ſemetipſo perpeſſus erat hanc operationem, refero, ut alios excitem ad indagandum atque tentandum hunc modum,* cum videant humanam induſtriam eò jam perveniſſe, quo negant hactenus ab ullo mortalium perventum eſſe.

a ſmall inciſion made according to the grain of the fibres will yield much more, and can, by laceration, be ſomewhat widened if it have been made too little (for the wound that is to be made in cutting the ſtone is better a little too ſmall than too great); and by this means, with his fingers he eaſily draws out the ſtone without the uſe of any other inſtrument, and after having cleanſed the wound, he conveys and thruſts back the bladder to its place, whence it had prevented alſo the droppings of the urine, by dreſſing the patient with an ordinary band, *who in ſeven or eight days is poſitively cured.* I have alſo read a printed letter, intitled La nouvelle Maniere de tailler la Pierre; i. e. *The new Manner of cutting the Stone;* wherein it is affirmed, that then this maſter had already cut, after this way, above fifty perſons, of twenty, thirty, forty, fifty, and ſixty, years of age, with ſo good ſucceſs, that not one of them all had died, yea, that very few or none of them had had ſo much as a fever. Thus you ſee, that art is more and more improved by continual diſcoveries, for which we ought to praiſe Almighty God, vouchſafing ſuch and the like new remedies to the benefit of mankind."

But the phyſicians of Paris could by no means regard the appearance of La Raoues as the ſign and working of God's Providence in behalf of mankind. They purſued him with their utmoſt malice, and prevailed, at laſt, on the learned Drelincurtius to come forth the fool of the pantomime, the ——— of their plot. They ſet him the taſk of repreſenting this innocent man in the moſt ludicrous and moſt deteſtable point of view: they called *Le Raoues* a new ſaint, and required Drelincourt to write the legend of his miraculous cures in terms of deriſion, and to alarm all France with relations from which modeſty and decency muſt revolt.

"The head and front of his offending" was only this: that having operated with ſingular ſucceſs in the towns and provinces of France, he ventured at laſt to appear in Paris, and had the audacity there to obtrude himſelf (in the houſe of Bourdelot the King's phyſician) into a ſociety of learned men; where, in the preſence of His Highneſs the Prince of Condé, he vaunted of a diſcovery, which he ſaid he had diſcovered four years before, of cutting for the ſtone by a new operation, more expeditious, ſafe, and eaſy, than that of the great apparatus then in uſe.

This operation Drelincourt proceeds to deſcribe in the following terms: "He operates like all other quacks, by cutting upon the gripe; he feels for the ſtone with his fingers in the rectum, makes the patient, before operating, walk a turn or two through the room to bring the ſtone to the neck of the bladder; he places him

in the lap of a ſtrong aſſiſtant, who, joining his hands over the patient's belly, preſſes, with the help of compreſſes, upon the epigaſtric region; when he is about to cut, he introduces his fingers very high in the rectum, and ſeizes and fixes the ſtone with equal eaſe in boys and in grown men. I was aſtoniſhed," ſays Drelincourt, "when I ſaw what muſt have ſeemed incredible had it been only reported to me: he introduced not two fingers into the rectum, but three, and paſſed them till his hand was ſtopped by the thick fleſh of the muſcles of the thumb, in a manner which I never could have conceived, but I have ſeen it, and have ſeen it with horror. (C'eſt un fait que je ne pouvoit m'imaginer; mais j'en ay été témoine oculaire, et j'en ay eu de l'horreur.) Holding his victim thus impaled, he curved the points of his fingers very ſtrongly, preſſing the coats of the rectum violently towards the bladder; and through the coats of the bladder, and the three coats of the rectum, does this operator diſcover not only a ſtone, but any number of ſtones, their ſize, ſmoothneſs, roughneſs, ſoftneſs, hardneſs, weight, and colour even.—Then catching the ſtone betwixt his fingers, placing it in a favourable direction, and preſſing it down towards the tuber-iſchii, he at once preſſes down the ſtone with the fingers, and extends the ſkin over the perineum (by drawing it towards the right ſide) with the thumb of his left hand, and taking in his right the knife or razor, which till then he holds in his mouth, he cuts upon the ſtone with a ſort of lunated inciſion, the horns of which look towards the left hip: he then cuts deeper, dividing through the erector muſcle of the left ſide, cutting an inch above the anus, and nearly an inch to the left of the rapha perinæi. The inciſion is continued till the knife grates upon the ſtone; then preſſing the bladder at once with both hands, with the right above the pubis, and with the left from within the rectum, the ſtone leaps out into his breaſt or ſhirt collar, or if it do not, is picked out with the fore-finger. Thus does he extract the ſtone from the biggeſt and fatteſt perſon with eaſe."

"Now forſaking" ſays Drelincourt, "his hold of the bladder within, and of the ſkin without, he allows the parts to be retracted, by their natural elaſticity, different ways; the bladder returning to its natural place, recedes towards the right; the ſkin of the perinæum is retracted towards the thigh, i. e. towards the left; and the wound is ſo cloſed that the urine immediately paſſes the natural way."

"The patient, after getting up, making a few ſteps and ſtrides about the room," ſays Drelincourt, "to clear the bladder, or ſhaking himſelf, or jumping over his garter, is laid in bed; and this Jack-pudding of a Charlatan plaſters up his bottom with a

paſte of flour and eggs; and keeping a mountain of flour over the wound, thus bandages his poſteriors."

Although Le Raoues had cut hundreds for the ſtone in Rouen, Bourdeaux, Niſmes, and other cities, it was boldly affirmed that he had cut thoſe only who had not the ſtone: it was thus that his rivals thought fit to explain the miracles he ſeemed to perform.

This tale is told by Collot, his moſt invidious rival, in very plain terms: "Le Raoues," ſays Collot, "having operated on many in Bourdeaux, who had not the ſtone, received the thouſand piſtoles which theſe operations produced him, and made his eſcape: he ſoon after arrived in Paris, where being more narrowly watched, he was detected in his arts and practices: he was obſerved to make an inciſion in the hip, too ſuperficial even to reach the bladder or internal parts, much leſs to cut through them; and the ſtone produced by this operator was one which he held in his ſleeve, dropt into the palm of his hand at a fit period of the operation, and preſented to the ſpectators, ſoiled with the blood of the wound: nay the enemies of Raoues affirmed, that ſome of thoſe who died by accident after theſe ſuperficial inciſions, were found, (upon opening their bodies,) to have in the bladder, many ſtones, without the ſlighteſt ſcar or mark of the inciſion having ever reached that part.—"One day," ſays Collot, "while Le Raoues was cutting a boy for the ſtone, the ſervant was detected in the act of ſlipping a ſtone into the maſter's hand; who, for fear of a proſecution, withdrew himſelf from Paris, and was never heard of more. Theſe," ſays Collot, "were the tricks by which he had raiſed a momentary reputation in the provincial towns; and theſe were the ſort of operations he had performed with ſuch applauſe at Bourdeaux."—"Il eſt vrai qu'il en tailla pluſieurs a Bourdeaux; cependant on ne fut que trop perſuadé dans la ſuite qu'il *n'y avoit pas un ſeul de ſes malades auquel il n'eut ſuppoſé la Pierre.* Collot, ſur la Pierre."

This is a tale founded in malice, and hardly deſerving of refutation: Le Raoues was in poſſeſſion of a plain, ſimple, ſucceſsful operation, which he well knew how to perform, and had as little need as Collot himſelf to reſort to artifice. But it was the practice of the ſurgeons and lithotomiſts of Paris, the moment they found their province invaded, to fabricate the moſt ſcandalous falſehoods. Collot was the King's lithotomiſt, and his family continued ſo for many generations; he could not but feel jealous and indignant at this low and ignorant man aſſuming the title of lithotomiſt. Le Raoues muſt, from every circumſtance in his ſituation, have had many enemies,

and it is ſurely more natural to believe that cunning and intereſted men contrived theſe tales, than that even the moſt unprincipled wretch could dare actually to commit ſuch cruelties: ſo atrocious is the crime alleged againſt Le Raoues, that he muſt be acquitted! If he did indeed perſuade the people to ſubmit by ſcores to the operation, without having ſuffered the torments of the diſeaſe, and perſuaded the ſpectators that they ſaw him extract the ſtone, he muſt, with all the addreſs of an empyric, have had "a tongue that could wheedle the devil!"

But he was belied: his operation, even as deſcribed by his enemy Drelincurtius, is ſuperior to any practiſed by the family of Collot. The Collots traduced him, and accuſed him of making inciſions when he had no intention of cutting for the ſtone! but full ſorely did this ſame family of the Collots ſuffer in their turn: they were accuſed by others of the ſame crime: "even-handed Juſtice was in this moſt juſt, commending th' ingredients of their poiſoned chalice to their own lips." Collot, the father, was himſelf afflicted with the ſtone, and the operation was performed by his ſon! This was a painful and terrible act of duty and obedience! what was the young man's reward? what ſaid the rivals of this family?—That it was a mock operation, well concerted betwixt the father and the ſon, as if Collot could not bring his ſon into the world by any device, but by being at the ſame time delivered of a ſtone *! Yet ſo much did this villanous report prevail, that the editor of Collot defends him from the accuſation. "Des eſprits ſoupçonneux ont cru qu'il n'avoit voulu donner qu'un example de confiance; mais des témoines oculaires m'ont confirmé qu'il avoit la Pierre." Such were the arts in uſe in this abandoned city; which a man, ſo meritorious as Le Raoues, and ſo unſupported, could not eſcape, could not withſtand.

After many other contemptible inventions for bringing this man into diſrepute, Drelincourt had the meanneſs to alarm the people of France about the pollution of their women; in terms incredibly low and abominable. "Digitos ſuos ſalaces et improbos in ſinum pudoris laſcive et nequiter adigit ſique in nubæ criſtas terit, ipſa virginalia clauſtra rumpit. Pudibundone quippe et anilliſſimum pudicitiæ ocellum vix hiſcentem illiberaliter et proterve legit atque decerpit. Imò cum ſinat licet, en rubentem ejus gemmantemque calycem amiciſſime gemmarum connexu conjunctiſſimum necdum hiantem præmature explicat et diffundit."

This is horrible, and altogether abominable! it is addreſſed plainly to fanatics,

* The family of the Collots operated with the apparatus-major, which is next to be explained.

prieſts, and partiſans; and, through an affected modeſty, it is (though in a French book) written in Latin, that it might be conſtrued to every curious dame, by her confeſſor and domeſtic prieſt, with ſuch comments as the text might require. Thus did the learned Drelincurtius ſet himſelf to the degrading taſk aſſigned him, with that fervour of malice "which outruns the pauſer reaſon," and bartered away his academic honours for a cap and bells.

COMMENT ON THE OPERATION OF LE RAOUES.

Let us candidly, and for the ſake of ſcience, reflect on the nature of this operation, and condeſcend to receive one leſſon more from a claſs of men who have already given us many that are very memorable. Every thing in this operation, that is thus condemned by Drelincurtius, is peculiarly commendable; his criticiſms are moſt erudile, but moſt unſkilful, ſo that we may venture to pronounce this man, "with all his learning, to have been the moſt ignorant man in Europe." His raillery could not but be miſplaced, ſince he criticiſed what he could not underſtand. He was not aware that this was an operation to be improved, not by learning, but by practice! the operation had indeed been improvd, by thoſe itinerant lithotomiſts, to that degree of excellency, that we may ſubſcribe with confidence to the rules and practices of Le Raoues.

Le Raoues is accuſed of making his patient walk round the room to bring down the ſtone to the neck of the bladder. What ſays Celſus to this practice? "Ambulandi vero inter hæc exercitatione utatur quo magis calculus ad veſicæ cervicem deſcendat." This is the ſame rule delivered in language which Drelincurtius would not have ventured to diſpute.

The practice of bringing down the ſtone to the neck of the bladder had been in uſe, wherever the operation by the apparatus minor had been performed. Parée particularly recommends the practice. The grave and learned Roman makes the patient perambulate the chamber: the merry Frenchman makes him dance till it falls down: "Ayant dont ſuppoſé que nous avons un jeune enfant à inciſer, il faut premierement que le chirurgien le faſſe ſauter cinque ou ſix fois à fin de faire deſcendre la Pierre au fond de la veſſie." But Van Horne is ſtill more amuſing, and requires, I think, too much agility and ſpirit on the part of his pa-

tient: he makes him, after dancing a while, leap from the higheſt ſtools in the houſe. " Jubemus ægrum aliquoties ſubſilire, *aut bis terve de ſcamno aliquo deſilire ut* calculus deorſum prolabatur ad collum veſicæ."

Le Raoues was next accuſed of " pretending to feel through the coats of the bladder, and through the three coats of the rectum, the ſize, ſmoothneſs, roughneſs, ſoftneſs, hardneſs, weight, and colour, of the ſtone." What ſays the text of the claſſical Celſus to this point? Celſus certainly inſtructs the operator how to recognize a rough, a ſmooth, an oblong, or flattened ſtone, and how to preſent it ſo to the perinæum, as to paſs through the wound in the moſt favourable way. Celſus indeed preſumes every thing to be diſtinguiſhable through thoſe ſame coats of the rectum, except the colour of the ſtone; and the colour of the ſtone, though it was of no importance in the opinion of Le Raoues, was of ſingular importance in the opinion of Drelincurtius, ſince it enabled him to repreſent Le Raoues in terms of ridicule.

Le Raoues was accuſed too, of thruſting more than two fingers, of driving almoſt the whole hand into the rectum, in a manner which ſtruck Drelincourt with horror: but what avail the horrors of a man ignorant in ſurgery, and unaccuſtomed with operations? The horrors of Drelincurtius are of no more importance than the tremor of a woman or a child at the ſight of blood. Every perſon who ſtands as a mere ſpectator to witneſs the unavoidable pangs of an operation, muſt have acute feelings; but if he do not underſtand what is uſeful and what is hurtful in that operation, his feelings muſt be but prejudices of little account. Drelincurtius never thus handled a ſtone to eſtimate its form or ſize, while Le Raoues had ſearched thouſands, without the help of the catheter. The diſtinctneſs with which the ſtone is felt with the finger, muſt have appeared incredible to a phyſician; even to ſurgeons I am ſorry to think how little this ſenſation is familiar. Surgeons introduce the ſtaff becauſe they are to cut upon it; but they are indifferent about feeling, with the fingers the actual ſize of the ſtone. They make their inciſion without being able to aſcertain whether it be proportioned to the ſize of the ſtone. Now this is ſtrange! a ſurgeon would not chooſe to open an abſceſs of the neck, or of the perinæum, without wiſhing to know whether ſuch abſceſs opened into the throat, or urethra, or rectum? yet the ſurgeon who examines a ſlight abſceſs carefully, and opens it with circumſpection, plunges his gorget into the bladder, without condeſcending previouſly to put his finger into the rectum; he truſts to the clicking of his ſtaff, and is indifferent about the ſize, if he be only ſure of the exiſtence

of a ſtone. That Le Raoues was forced to grope hard for the ſtone was the inevitable conſequence of his venturing to do what regular ſurgeons have ſeldom done, for they in operating with the apparatus minor have cut boys only, while Le Raoues cut men of thirty, fifty, and ſeventy years of age. 2d. Had Drelincourt attended to thoſe leſſons which Le Raoues offered freely to every ſurgeon, he might have been taught by him, that to feel the ſtone diſtinctly and reach it fairly in the adult, and to hold it firm even in a younger ſubject, both ſkill and boldneſs, and the introduction of more than two fingers are required.

It ſtands then upon record, that Le Raoues was particularly careful to aſcertain the ſize of the ſtone, for which purpoſe he carried the patient into a private room, and there, alone, or with his ſervant, examined by the rectum; that when he brought him out for public operation, he ſhowed particular addreſs and boldneſs in catching the ſtone under his fingers, preſſing it firmly againſt the perinæum, and making it even leap out into the collar of his ſhirt as ſoon as the inciſion was performed; that before he made his inciſion, he drew the ſkin powerfully to the right ſide, and holding it ſo with his thumb, while he performed the inciſion, allowed it then to be retracted ſo as to cover the deeper wound; and that he moreover endeavoured to enſure a perfect adheſion, by cloſing the wound nicely with flour mixed up with the white of eggs. When I obſerve all theſe wiſe and rational precautions, I am fully perſuaded that this operation had been gradually attaining to great perfection in the hands of practical men, who were ſo far rude and ignorant as to know no other; and can eaſily believe what the admirers of this Le Raoues affirmed, that he was ſometimes able to carry his patients abroad in not many days *.

Drelincourt had the misfortune to criticiſe ſteps in the operation which he could not comprehend; and the confidence with which he expoſes what he thinks errors on the part of Le Raoues, may ſerve as a warning to men whoſe propenſities lie

* This is a fact reported indifferently by the friends and by the enemies of Le Raoues. Mingelouzeau reports that by his management of the parts by drawing aſide the ſkin with the thumb of the left hand, while he cut with the right; by allowing it to be retracted after the extraction of the ſtone, his patient immediately paſſed the urine the natural way; nor can we wonder at this ſince the ſame happens in our deep and direct inciſion. He alſo informs us that Le Raoues cut the neck of the bladder at the ſame time with the integuments. He ſays that while Le Raoues cut boys only, he ſucceeded, but when he ventured to perform this operation on adults, he was leſs fortunate. "Et il ſe trouvoit que la playe du col de la veſſie ne repondoit plus à la playe des intéguments, mais en étoit couvert; *et le malade ne rendoit point ſon urine par la playe qui ſe renfermoit* très facilement." In the city of Bourdeaux alone (ſays Mingelouzeau) he cut eighty-two perſons of various ages for the ſtone.

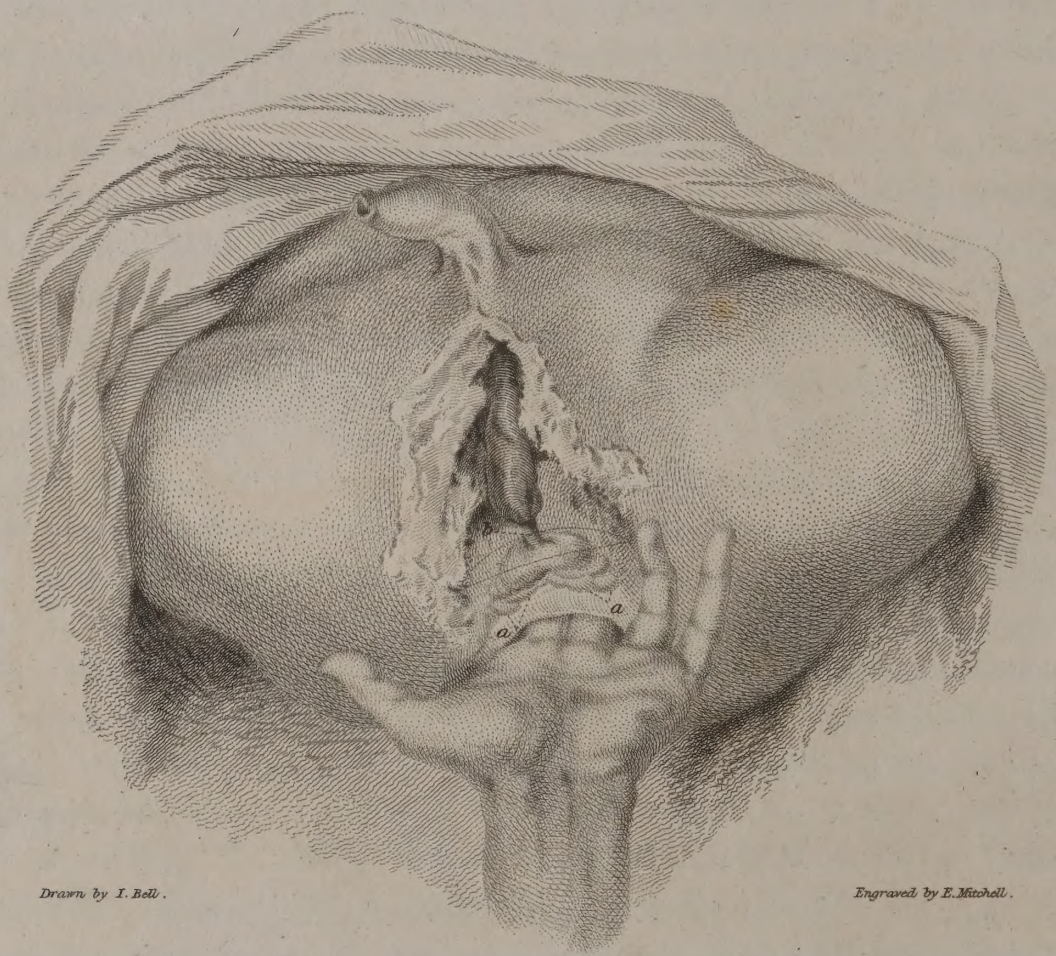
this way, who think themſelves men of wit and merriment, and regard ridicule as the teſt of truth. It is not from caprice that I approve what others have choſen to condemn, but from a ſerious conviction that theſe are the beſt rules and practices hitherto laid down! I declare that I ſhould rather take for my maſter the contemned Le Raoues, than the celebrated Aulus Cornelius Celſus.

ANATOMICAL ANALYSIS OF THE APPARATUS MINOR.

But this operation gradually improving in the hands of practical men, inſenſibly attained to a degree of perfection not yet remarked, and which conſiſted not merely in the dexterity with which the ſtone was graſped and held down, nor in the proviſions for a ſpeedy reunion of the wound, but in the direction and form of the wound itſelf. The inciſion for lithotomy was, from the time of Hippocrates, Ammonius, and Meges, down to the days of Celſus, tranſverſe and lunated; it croſſed the perinæum near the anus, and it was ſtill of a lunated form in the time of Le Raoues, who made, according to the deſcription of Drelincurtius, "a lunated inciſion nearly an inch to the left of the rapha perinæi, and with horns looking towards the left hip: this man, in ſhort, cut in a ſort of ſemicircle round the tuber iſchii. At ſome period of which we have no diſtinct record, but probably near the time of Le Raoues, lithotomiſts changed this lunated for a longitudinal inciſion. Frere Jaques had two operations, the one, viz. that by the apparatus minor, in which he cut upon the ſtone; the other peculiar to himſelf in which he cut upon the ſtaff. Perhaps he learnt his operation by the apparatus minor, from Le Raoues, in performing the inciſion he would naturally carry his knife longitudinally and in the ſame direction that he did in cutting upon the ſtaff, which was his own peculiar operation.

"Having aſſiſted," ſays Mery, "at all the operations of Frere Jaques, in the Hotel Dieu, I have had occaſion to obſerve his way of operating with the apparatus minor on little boys: Paſſing the fore and midfingers of the left hand into the rectum, and laying the left upon the pubis, he grapples the bladder, and forces down the ſtone till it preſents, in boys, in the perinæum, and in women, betwixt the vagina and pubis; and holding the ſtone firm with his left hand, he cuts with his right, making his inciſion from the tuberoſity of the iſchium towards the ſtone,

Anatomy of the Apparatus Minor.



Drawn by I. Bell.

Engraved by E. Mitchell.

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ſo that betwixt his two operations, that by the leſſer, and that by the greater apparatus there is not the ſlighteſt difference with reſpect to the inciſion." Thus it came to paſs, at what period we do not expreſsly know, that the inciſion by the leſſer apparatus was approximated to that by the greater apparatus; the inciſion performed by the itinerant operators of the ſixteenth century, with that performed in modern times by Raw, Cheſſelden, and the ſurgeons of the preſent day; for ſince the inciſion was in the ſame place in the ſame direction, dividing the ſame parts, it made no eſſential diſtinction whether it was performed, as among theſe itinerant operators, by cutting upon the ſtone, or as by modern lithotomiſts, by cutting upon the ſtaff.

To underſtand how eſſential an innovation this was, we muſt apply to the preſent as to every other innovation, the teſt of anatomy.

Firſt, It will be obvious that the operation of the ancients is full of danger, for the parts cut muſt vary according to the degree in which they are protruded by the fingers; it is, no doubt, poſſible to perform the operation ſafely, for the parts may be protruded by the finger in the anus, (as in the plan, page 60,) in ſuch a degree that the lunated inciſion ſhall divide the neck of the bladder, and cut through the proſtate gland, without injuring the veſiculæ (a a) or the urethra (b). Secondly, It is obvious that if the parts be in any particular ſubject larger, or (in conſequence of the peculiar manner of the operator) more protruded, the inciſion will not be in the ſubſtance of the gland, nor ſtrictly in the neck of the bladder, but behind the gland and acroſs the two veſiculæ where they enter under the gland. Thirdly, it is manifeſt, that if the parts were leſs ſtrongly preſſed upon, the neck of the bladder and proſtate gland would not be at all protruded, the inciſion would paſs through the anterior part of the gland, and then the membranous or naked part (b) of the urethra where it turns round under the pubis being interpoſed, would be cut off from the bladder, and if the patient ſurvived the operation, he would labour under an incurable fiſtula. Such are the manifeſt dangers of this operation deſcribed by Celſus. Fourthly, it was plainly the chief advantage of the lateral inciſion (i. e. of the inciſion on one ſide of the perineum,) as practiſed in the time of Le Raoues and Frere Jaques, that it obviated this danger; in this lateral inciſion the urethra eſcaped, and thence Le Raoues, Hieſter, and others, who favoured this operation, practiſed it with a degree of ſucceſs and ſafety, though, no doubt, among their patients alſo many died, and ſome had fiſtulas. But it muſt occur to any one who reflects on the poſture in which the

parts are held on the points of the fingers, that the ſlighteſt degree of obliquity in the wound, the ſlighteſt deviation of the inciſion from its due place, the ſlighteſt prolongation of the upper horn of that lunated inciſion, (whether it has its horns turned towards the right or towards the left hip) would ſever the urethra from the bladder.

Nor is this at all an imaginary danger: "On the 20th of May," ſays Mery, "I performed, in preſence of Frere Jaques himſelf, accompanied by the ſurgeons and phyſicians of the hoſpital, the diſſection of ſix boys cut by him for the ſtone; and in all the ſix we found the *bladder ſeparated from the urethra where it enters the penis*, and the blood veſſels of the penis torn acroſs or divided by the knife. And, on the 2d of June, I diſſected the body of a boy thirteen years of age, cut by Frere Jaques, by the gripe, in whom we found the bladder ſeparated from the penis and from the pubis, the arteries and veins cut acroſs, and the hæmorhoidal veins alſo divided." Theſe are fatal proofs of the ill effects of ſuch irregular inciſions, and ſerious examples of an excellent operation being ill performed. But all theſe dangers are obviated at once, by introducing the ſtaff into the bladder, for that prevents a poſſibility of our cutting off the urethra, and not to cut into the neck of the bladder when cutting thus upon the ſtone itſelf, is impoſſible. In this way my brother, Mr. Charles Bell, has performed the operation rapidly and ſucceſsfully.

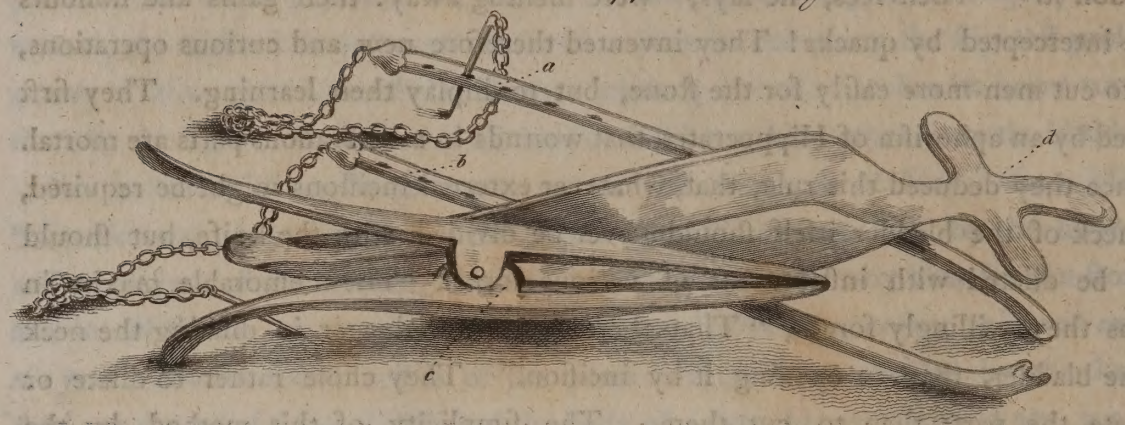
In operating by this leſſer apparatus, you cut upon the ſtone, and cut of courſe, with perfect ſecurity, an inciſion exactly proportioned to its ſize. There is no difficult nor dangerous diſſection; no gorget, nor other dangerous inſtrument, thruſt into the bladder, with the riſk of its paſſing in betwixt that and the rectum; you are performing expreſsly the lateral inciſion of Raw and Cheſſelden, in the moſt ſimple and favourable way; and, indeed, Raw himſelf, though he declined telling how he operated, always had the honeſty to refer the enquirer to Celſus—"Legite Celſum" was always his reply. But what makes the deepeſt impreſſion on my mind in favour of the apparatus minor is, that we are, by this operation, ſaved from the horror of plunging a gorget, blindfold, among the viſcera of a child, a cruelty of which I never ſhall allow myſelf to be guilty again.

Could then an operation ſo ſimple, ſo ſucceſsful, and which had been practiſed for ſo many centuries, be forſaken? Yes, ſurely! covetouſneſs, vanity, and pride, incited phyſicians learned indeed, but little ſkilled in ſurgery, to invent more ingenious and complicated operations, forſaking the priſca ſimplicitas inſtrumentorum ſo warmly praiſed by Heiſter; for Heiſter himſelf, practiſed the operation of the leſſer apparatus, and explains to us the unworthy motives which induced phyſicians to

abandon it. "Their fees," he ſays, "were melting away! their gains and honours were intercepted by quacks! They invented therefore new and curious operations, not to cut men more eaſily for the ſtone, but to diſplay their learning. They firſt proved by an aphoriſm of Hippocrates, that wounds in membranous parts are mortal. Thence they deduced this rule, that, whatever external inciſions might be required, the neck of the bladder itſelf ſhould never be divided with the knife, but ſhould only be dilated with inſtruments of various forms. The memorable maxim in Celſus they willingly forgot, "That there is greater danger in dilating the neck of the bladder, than in opening it by inciſion." They choſe rather to dilate or lacerate the parts than to cut them. The ſimplicity of this method, by the leſſer apparatus, and the facility with which it is performed, were indeed their chief objections to it. Senſim a præſtantioribus ac celebrioribus chirurgis ac lithotomis ob varias rationes et *potiſſimum forte ne propter facilitatem methodi antiquæ* numerus lithotomorum nimis augeretur atque *reditus* illorum imminueretur, ſæpius quam minor fuerit uſurpatus. — "Thoſe," ſays Hieſter, "who chooſe to ſpeak contemptuouſly of this method, repreſent it as an operation fit only for quacks and mountebanks, as an operation too low and contemptible ever to be practiſed by regular ſurgeons and phyſicians: modern ſurgeons," ſays he, "have invented more cunning and curious methods, ſuch as the vulgar do not know; ſuch as muſt captivate all ranks of men, the rich and great, as well as the vulgar, by the profuſion and elegance of the apparatus."—"Sunt denique etiam, qui, quando de apparatu abjecte loqui et ſcribere volunt, dicunt, eum eſſe illum modum quo hiſtriones et circumforanæi tantum uterentur; veros autem et genuinos medicos et chirurgos haud decere adeo vulgarem obſoletam, *abjectam et ſimplicem methodum;* ſed recentiores chirurgos magis *excultas, artificioſas atque ingenioſas uſurpare ſecandi rationes* quæ copia et nitore feramentorum arti ſplendorem, conciliarent atque *admirationem vulgi imo magnatum et procerum inſignem excitarent.*" Hieſter, page 178.

Such were the contemptible motives which induced men in the earlier times of ſurgery to invent that complicated operation which I am next to explain.

Inſtruments of the Apparatus Major



a. Male Conductor
b. Female Conductor
c. Simple dilator
d. Blunt Gorget

OF LITHOTOMY BY THE APPARATUS MAJOR.

SECTION III.

THE OPERATION OF JOANNES DE ROMANIS, OR OF SANCTUS MARIANUS BAROLITANUS.

The operation dignified with the ſonorous titles of Apparatus Major, and Marian Operation, was invented through motives of avarice, conceit, and folly, and by thoſe who deſpiſed the operation of Celſus, becauſe it was too plain, too ſimple, too eaſily performed, inſomuch as to have become the favourite operation of ignorant men.

They ſurely were ill qualified for inventing new methods, who declined the old becauſe it was ſimple! that which they invented, aſſuredly was not ſo! it was with incredible difficulty they extracted the ſtone through the narrow inciſion which was made in operating by the apparatus major; and, amidſt the violence of dilatating the parts, the cries of the patient were ſuch as it was not poſſible to hear without commiſeration. Their dilating inſtruments, their apparatus major, which was calculated to impreſs the great with admiration and reverence, ſtruck the patients with fear, and the ſpectators with diſmay. If Heiſter is to be truſted, and he was himſelf a plain blunt man, we muſt believe this new invention to have been the moſt criminal ever engendered by the deſire of gain! If we are to truſt to thoſe who ſaw it performed in all its perfection, it muſt have been the moſt cruel and horrible! what but cruelty and folly could reſult from the vain deſire of receding, as far as poſſible, from an operation which was avowedly very ſimple, and eaſily performed?

The reaſons which the inventors of this apparatus major were pleaſed to aſſign were but poor apologies for their conduct. They found out a text in Hippocrates, which declares, that "wounds of membranous parts are mortal; and thence they inferred that, in performing the operation of lithotomy, the bladder itſelf ſhould in no degree be wounded with the knife! They proceeded merely upon authority, and thought all was well if they could thus produce a text favourable to their deſign! The comments upon this text have been indeed perplexed and various, becauſe, like muſical accompaniments, they are modulated, ad libitum, according to the taſte and genius of the performer.

They had the cunning to pervert a general aphoriſm, a prognoſtic concerning wounds of the viſcera, to the particular purpoſe of regulating an operation which Hippocrates profeſſed not to underſtand, and from which he ſeems to have had an extreme averſion. They affirmed that the ancient doctrine forbade wounding the bladder, without recollecting that Hippocrates interdicted this operation to his diſciples only, becauſe it was practiſed by particular men *; and that thoſe profeſſed lithotomiſts, Ammonius, Meges, and others, performed their operation from the times of Hippocrates down to thoſe of Celſus entirely by inciſion. They forgot that it was the cuſtom of lithotomiſts not even to uſe the forceps, but to cut ſo fairly, that, after the inciſion was performed, they bolted out the ſtone with their fingers, or picked it out with a hook. They quoted the ancients in favour of dilatation, and forgot the ſecond or deep inciſion, the "altera tranſverſa plaga," of Celſus, "quâ cervix aperiatur."

Thoſe who invented the apparatus major deceived themſelves, by reaſoning on this ſuppoſed rule of Hippocrates; it was under pretence of avoiding membranous parts that they refuſed to open their way by inciſion, into the neck of the bladder: it was from the hopes of dilating the neck of the bladder as eaſily in man, where it is ſurrounded by the firm proſtate, as in woman, where it is not ſo, that they made their wound only upon the perinæum, opening nothing but the urethra, with the knife, and leaving the neck of the bladder to be torn by dilators: So much did they affect to fear the wounding of membranous parts, that they would not even approach the rapha perinæi, with their inciſion, but drew the ſkin to one ſide to avoid it. "Dextrâ vero manu," ſays Marianus, "dextrâ vero manu compactis æquatiſque digitis, pelliculam ad ſiniſtræ natis latus contrahat, ut *commiſſura* ad latus

* This was the part of the oath that related to lithotomy. "Neque vero calculo laborantes ſecabo, ſed magiſtris ejus rei peritis id muneris permittam." *Hippocrates.*

declinet, ne ſuper ea incidatur quoniam eſſet malum. *Eſt enim commiſſura ſecundum experientiæ veritatem locus mortalis, ſi ſuper ea incideretur.*" Thoſe who are moſt acquainted with the anatomy and texture of theſe parts, will beſt conceive the horrors of an operation in which nothing could be accompliſhed till the proſtate gland was burſt up with dilating inſtruments of various forms, for, in operating with the apparatus major, they tore thoſe delicate parts (perinæum and all) which they were afraid to cut, and talked confidently of dilating and gradually ſtretching the parts, while they were conſcious of lacerating them.

This operation was invented by Joannes de Romanis, a ſurgeon, of Cremona, in Italy, who might perhaps have been able to tell a plain tale how his operation was to be performed, but who did by no means preſume to write a book upon the ſtone. It will be recollected that the ſurgical obſervations of Paræus were leavened and kneaded up into chapters and ſections, by certain learned doctors of the univerſity of Paris; and the operation of Joannes de Romanis was in like manner delivered over to the talents of the learned and moſt eloquent Marianus Sanctus Barolitanus, who deſcribes it in magnificent terms. He ſeems at firſt ready to ſink under the ignominy of his ſituation, when obliged to acknowledge that this auguſt operation is to be performed even with a razor!—a barber's razor! but this humble inſtrument he ingeniouſly deſcribes in a ſtrain of moſt poetical metaphor. "Novacula Barbitonſorum peculiare eſt inſtrumentum quâ cum volunt barbam depexam abradere uno ipſius tractu mille ruunt capilli."—"The barber's razor, friendly reader, is a moſt important weapon, wherewith, when the buſineſs is to ſhave, cut cloſe, and utterly ſubdue a ſtubborn and rebellious beard, the barber mows down the hairs! thouſands falling before him at each remorſeleſs ſtroke!" Never was the pride and pomp of ſurgery ſo nobly ſupported as by this big-mouthed Marianus Sanctus Barolitanus; not an inſtrument is there under the apron ſtring of the lithotomiſt, which he does not celebrate in equal ſtrains; and as dilatation was the chief purpoſe of the operation, and dilators the peculiar and important inſtruments, the number of which characteriſed the operation, the deſcription of dilators proportionally excels that of the razor. "Look but to the aperiens," (and that you may look at this gaping aperiens, it is drawn on his margin)—"Look but to the aperiens! how it gapes with deſire, when the conductors have made way for its approaching, and, ſeizing the ſtone; it rages like the ferocious ſoldier ready to enter the breach in the walls of a beſieged city."—"Si quis modo inſpiceret qua hilaritate aperiens geſtiat, cum ductores

locum, quem illud viam ad lapidem extrahendam faciet præparâſſent, ipſum denique crederet non minorem voluptatem animo fovere quam qui ad diruendam urbem, quæ diu obſidione milites fatigaverit, accinguntur." Next come the voracious and vociferous forceps, roaring, and gaping for the ſtone. "For this," ſays Marianus, "is the drawing of the forceps themſelves, which often, when their morſel is too large for them to devour, cry out for the aid of their two ſupporters, or latera, which are then laid ſide by ſide with the forceps. Hæc eſt igitur forma ipſius forcipis qui ſibi duo latera aliquando jungi *vehementer vociferant;* cum bolum quem ipſe comprehenderat, præ magnitudine ſine duorum laterum auxilio, foras extrahere minime valuerit." Such were the magnificent deſcriptions tranſmitted to us by Marianus, of that barber's razor which, put in motion by his hand, mows down millions of hairs, "uno ipſius tractu"; and of the gaping dilators and roaring forceps, vociferating for help, and raging for the ſtone.

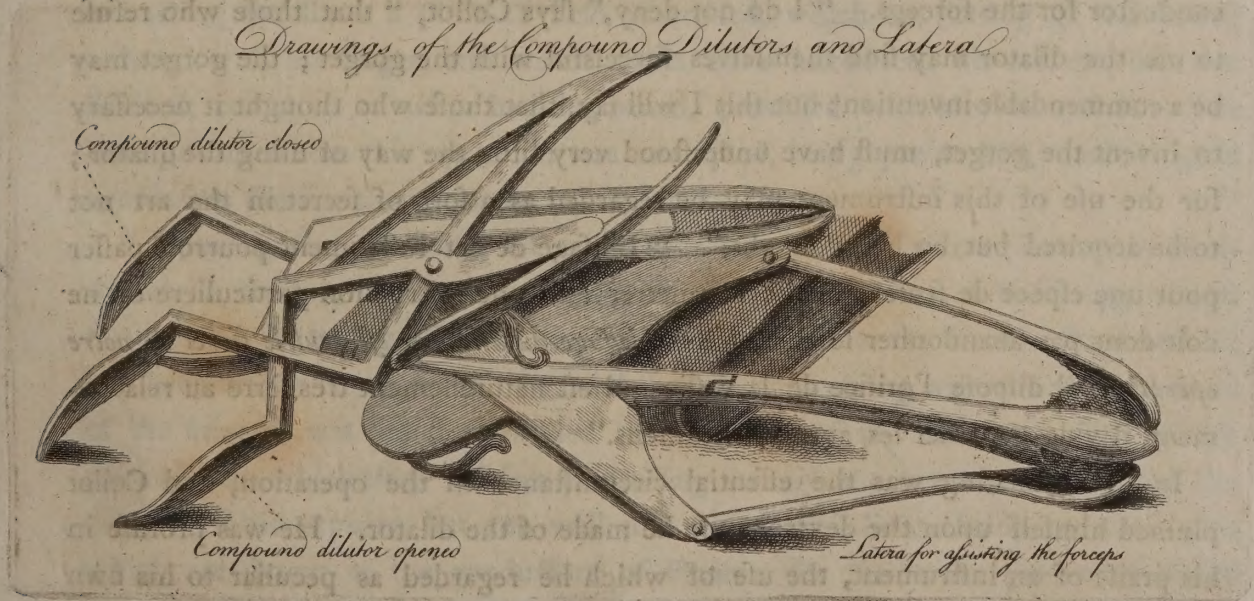
Theſe poetical eulogiums of the apparatus major do not belie the intentions aſcribed by Heiſter to innovators, who were, he ſays, inſpired by no better motives than avarice and pride. To ſeparate the ſenſe from the extravagance of theſe deſcriptions, and tell plainly what ſort of operation they performed, is no eaſy taſk. It would appear that the operator, kneeling on one knee, made an inciſion, with his razor, along the perinæum, to one ſide of the rapha; and, feeling with his little finger for the curve of the ſtaff, he opened the membranous part of the urethra, and fixing the point of the knife in the groove of his ſtaff, gave it to an aſſiſtant to hold while he paſſed a probe along the knife into the groove of the ſtaff, and thus into the cavity of the bladder. When the probe was thus paſſed into the bladder the urine flowed out, and, the probe being fairly in the cavity, the ſtaff was withdrawn. The operator next took in his hands two conductors, a ſort of ſtrong iron probes, the one (named the female conductor) having in it a groove like that of our common directory, the other (the male conductor) having a probe point, correſponding with that groove; and the grooved, or female conductor, being paſſed along the probe and lodged in the bladder, the probe was withdrawn, and the male conductor paſſed, in its turn, along the groove of the female conductor, till both were lodged in the bladder, lying along ſide of one another. Then commenced the operation of dilating: The lithotomiſt took a conductor in each hand, and by diverging their ſhafts from (a b) to (c d) dilated, or, in plain language, tore open the proſtate gland (e). (Vid. anatomical ſcheme of the operation by the apparatus major.)

Thus was the wound ſtretched by the conductors, that it might admit the dilator, which was an inſtrument reſembling forceps, whoſe points, by a ſort of double hinge, diverged and opened in proportion as the handles were preſſed together. The dilator being paſſed betwixt its two conductors, was preſſed into the narrow wound, and the conductors being held faſt and ſteady, the operator began to act ſlowly with his dilator, and by regular and ſucceſſive ſtrokes, continued to ſtretch the wound till he was ſenſible it could admit the forceps. Then the dilator was, in its turn, withdrawn, the great forceps preſſed in betwixt the conductors, were wrought forwards with a rotatory motion, till they paſſed into the wound; then they were turned round and round in the bladder, till they lay freely in the bladder, ſo that the operator could open them for the purpoſe of graſping the ſtone.

Theſe rules for performing this operation are delivered by Marianus in ſuch pleaſant terms, that nothing preſents itſelf to the imagination of the reader, but a ſucceſſion of eaſy operations; the probe gliding ſmoothly along the ſtaff! the conductors along the probe! the dilator along the conductors! and the forceps laſt of all. It was not till new and more ſucceſsful operations were invented, that the cruelties or dangers of this one were brought to light. Marianus plainly intended to write nothing but in the way of eulogium concerning that operation, which he contrived ſhould be called by his own name; nothing is ſaid of the lingering ſufferings or piteous cries of his patient; his hyperboles he reſerves for the praiſe of his irreſiſtible inſtruments; he ſpeaks of no courage but that of his gaping dilators, nor of any cries but thoſe of his vociferous forceps: but after-ages told another tale.

The book of Marianus contains the oldeſt deſcription we have, of an operation, which maintained its place for ſome hundred years, and loſt during all the period none of its horrors. Paræus was the immediate ſucceſſor, or rather the contemporary of Marianus; and, in his time, the cruelties of the apparatus major having become only more ſyſtematic and orderly, we can from his text ſupply whatever is left defective in that of Marianus. I believe that the dilatation performed by theſe operators might fairly be divided into three ſucceſſive ſtages. Firſt, ſuch a degree of dilatation accompliſhed by the diverging and drawing aſunder of the male and female conductors, as to admit the dilators: Secondly, ſuch a degree of dilatation accompliſhed by the dilator, the moſt cruel of all this apparatus, as to admit the forceps: Thirdly, a dilatation accompliſhed by turning the forceps, in all poſſible directions, till the operator found room to turn them freely in the bladder in ſearch of the ſtone, which was extracted by continuing to turn them from ſide to

ſide. Paræus dilated, more than other ſurgeons, with the forceps; firſt he introduced his conductors, which were indeed eſſential to the introduction of the forceps; then the duck-bill forceps were thruſt, with violence, betwixt the conductors, into the cavity of the bladder; "then the forceps were opened with both hands, turning them forcibly at the ſame time, from right to left, this way and that way, to dilacerate and enlarge the wound."—"Puis l'ouvrir de deux mains, les tournant à dextre et ſiniſtre, *çà et là, pour dilacérer et aggrandir le playe.*" "And next, Paræus when he could not prevail, and it was neceſſary to dilate the wound ſtill more largely, betook himſelf to the inſtrument named dilator." But every ſucceſſive ſtep of the operation excels the preceding one in ingenious cruelty; the latera or ſides, which are deſcribed by Marianus as aſſiſting the forceps (when they have roared in vain), are plainly and ſimply deſcribed by Paræus, under the name of ailerons or wings. They are uſed as aſſiſtant forceps, but the forceps filling up the wound, and the operator unwilling to loſe his hold of the ſtone, the two latera were paſſed by the ſides of the forceps, and locked upon the ſtone, ſo that the whole reſembled a four-bladed forceps; but with this peculiarity, that the latera or aſſiſtant forceps were ſo hinged upon each other, that upon claſping the handles, the points cloſed, and the hinges at the ſame time roſe, ſo that the inſtrument ſerved at once the double purpoſe of dilators and aſſiſtant forceps. That the cruel manner in which the general operation was performed, may be fully underſtood, I have here given a plate of thoſe dilators:


Drawings of the Compound Dilators and Latera
Compound dilator closed
Compound dilator opened
Latera for aſſiſting the forceps

Yet none of the direct rules for performing these cruelties make so strong an impression upon my mind, nor so plainly prove the cruel nature of the invention, as the accidental disputes about the use of the dilator. Next to Marianus and Paræus came the family of the Collots, who practised this dilatation with great assiduity, and affected particular dexterity in the use of the dilator. They had been famous lithotomists for eight generations, during all which period they had kept their operation a secret, till, at length, a book was found in the closet of the elder Collot, written in his old age, after he had ceased from the labours of his profession, containing an authentic history of his operation. This man was contemporary with Paræus: he had been elected royal lithotomist (the first who held that title) under Henry II. of France: his operation, which he had learned of a lithotomist, of the name of De Ville, was plainly the Marian operation, with no peculiarity that I can perceive, unless it be the peculiar dexterity with which he affected to use the dilator, though little credit surely can be given to any report of a mysterious and cunning way of using an instrument which can plainly do nothing but lacerate, and that rudely.

The occasion which excited Collot to defend the use of the dilator is this: The gorget was first invented in the time of Collot; it was not, during many centuries, a cutting instrument, but merely a blunt wedge, a scoop of a conical form, which, from the form of its beak, slipped easily along the groove of the staff, and by its wedge-like shape dilated the wound, and by its groove or hollow served as a conductor for the forceps. "I do not deny," says Collot, "that those who refuse to use the dilator may find themselves successful with the gorget; the gorget may be a commendable invention: but this I will say, that those who thought it necessary to invent the gorget, must have understood very little the way of using the dilator; for the use of this instrument may be regarded as a sort of secret in the art not to be acquired but by being taught." "L'usage de cet instrument pourroit passer pour une espèce de secret difficile à penetrer sans une instruction particuliere on ne doit dons pas abandonner le dilatoire.—*L'usage du dilatoire est tout le secret de notre operation*, il dispose l'orifice de la vessie qui est naturellement très serré au relachement, il vide a manier les autres instrumens."

In short, dilating was the essential circumstance in the operation, and Collot plumed himself upon the dextrous use he made of the dilator. He was profuse in his praise of an instrument, the use of which he regarded as peculiar to his own family. "It is (says he) our whole secret in operating; it is by the dextrous

management of this inſtrument that we get the free uſe of all the others; it forwards the dilatation of the cervix veſicæ, and a little reflection will perſuade us that the affair has been miſrepreſented! The dilator is indeed painful in its introduction, but it is a pain which laſts but for a moment, and is to relieve the patient from the more excruciating torments of his diſeaſe." p. 314.

There is one precaution repeatedly inculcated by Marianus and others, which demonſtrates, in a particular manner, the violence with which this dilatation was performed, and it is this: "that while the dilator was paſſed betwixt the male and female conductors, it was neceſſary to hold them perfectly ſteady and firm!" What does this mean? why, that the dilator was forced in betwixt the conductors or grooved probes with ſuch violence, that if they were not held perfectly firm, they were in danger of being carried forward along with the dilator, and driven through the very fundus of the bladder. "A ſurgeon, little ſkilled in the operation of lithotomy, called together ſome of his friends, ſurgeons, and phyſicians, and among others Saviard (who relates the fact), to witneſs an operation. Although (ſays Saviard) it is not only neceſſary to keep the conductors ſteady, but in ſome degree to retract them while the dilator is puſhed onwards, this unfortunate ſurgeon puſhed on his dilator into the bladder, regardleſs of what might happen; allowed the conductors to be puſhed along with the dilator, and they pierced the fundus of the bladder. The ſurgeon had the good fortune to catch the ſtone before it eſcaped through the rent into the cavity of the abdomen. But while he was extracting the ſtone a piece of fleſh protruded, which he, (letting go the ſtone,) reduced with his finger, and would again have introduced his forceps, but that Saviard, conſcious of what had happened, prevailed with him to refrain. The little girl on whom this operation was attempted, being put to bed, died in great agonies on the fourth or fifth day.

"Upon opening the body, the conductors were found to have pierced the bladder at its fundus, the opening being ſuch as might permit a hen's egg to paſs through it. In trying a ſecond time to extract the ſtone, the forceps, ſtone and all, had been driven through the rent, and the ſoft ſtone giving way under the preſſure of the forceps, was found crumbled in the cavity of the abdomen. The ſpongy piece of fleſh which they had ſeen protruding through the wound, was a part of the ilium." This explains but too well the uſe of thoſe little chains and croſs pins which are drawn at the conductors of Paræus, for the croſs pins were paſſed through the holes to prevent the conductors being puſhed too deep. The con-

ductors of Joannes de Romanis Marianus, and others, were guarded by croſs handles, like that of a Roman ſword.

One circumſtance more gives us a terrible conviction of the cruelties of this operation, it is the uſe of the canula: In truth the wound of the Marian operation never healed, it continued, in four out of five caſes, fiſtulous for life; and the immediate diſcharge from the bruiſed and lacerated parts, required to be conveyed away as from the cavity of an abſceſs, by a tube. In the old method of amputating limbs the ſurgeon allowed the arteries to bleed, oſtenſibly to prevent plethora, but really becauſe he could not ſtop them. In the old way of lithotomy they introduced the canula into the wound, oſtenſibly to prevent healing, but really becauſe they could not heal the wound. They were exceedingly at a loſs for reſpectable reaſons in favour of the canula; Collot affects to quarrel with Frere Jaques for healing the wound too early: "This man," ſays Collot, "were he but learned in anatomy, and ſufficiently honeſt, would acknowledge the danger of healing up the wound too early: wounds of the fleſhy and muſcular parts may indeed be cloſed, becauſe they heal from the bottom, but not ſo in wounds of the bladder, where you unavoidably leave a cavity behind. The wound (ſays Collot) muſt then be kept open with the canula: Firſt, for fear of ſuppreſſion of urine in conſequence of a precipitate cure; ſuppreſſion of urine being a natural conſequence of what the cervix ſuffers during operation (qui ſe fait au ſphincter par le travail de l'opération): Secondly, it is neceſſary, inſtead of immediately healing up the wound, to allow a due time for the ſuppuration of the wounded parts, and the recovery of the bladder after the long preſſure of the ſtone: Thirdly, the patient would be in a very critical condition indeed, were there no outlet preſerved for the eſcape of whatever fragments and particles are broken off the ſtone by the forceps: Fourthly, it is neceſſary continually to cleanſe and purify the bladder from the feculences and diſcharges, which are collected in greater or leſſer quantity, according to the period during which the patient may have laboured under the ſtone; and it is occaſionally neceſſary to clear the bladder of fungous and other tumors, which often torture the patient till he dies." That the patient often died, and that his bladder, when he ſurvived, was ſlowly purified, I ſincerely believe; but in truth they were often altogether unable to extract the ſtone through the narrow wound made in operating with the apparatus major; the canula was left in the wound as a channel for the urine to paſs off by; and the canula by preventing any fulneſs of the bladder, or any action which might make it compreſs the ſtone, did in ſome degree aſſuage the pain.

Le Dran, ſpeaks like Collot, in very familiar terms, not only of leaving the canula in the bladder, but even of leaving the ſtone. "If in order," ſays Le Dran, "not to fatigue a diſtempered bladder, it be judged proper to leave the ſtone there, as I have ſeen done by a great man of our age, who, in this caſe, waited till the bladder was relaxed by the ſuppuration, to make the extraction, the paſſage remains always open and eaſy to introduce a forceps." This is the Operation en deux temps; i. e. leaving an interval betwixt the inciſions and the extraction of the ſtone, which has been boaſted of, like many other antiquated conceits, as an important innovation.

Even in the time of Collot, men began to revolt from the uſe of the dilator, and ſuch were the cruelties of the whole apparatus, that the moment Frere Jaques appeared, (who, though rude and ignorant, was the firſt who taught us thoſe bold and maſterly inciſions which the operation requires,) all men turned to him, and he was followed by Raw, Cheſſelden, and all the great ſurgeons and lithotomiſts of that age. Yet it muſt be confeſſed that there remained, for many years, a leaven of the old ſchool; the ſtaunch old defenders of the apparatus major died out, but they left behind them a ſort of neutral corps, who had, in their younger days, been taught this operation of the apparatus major, but had not yet performed it profeſſedly, nor found their own reputations connected with the fate of it. They ſeemed inclined even to deceive themſelves, by retaining the forms of the old operation while they eſſentially performed the new. They began, indeed, their operation, as in the old way, by cutting low in the perinæum, and opening only the bulb and membranous part of the urethra; but they finiſhed by running the knife forward and cutting the proſtate gland. This laſt motion of the knife, by which they ſlit up the proſtate, they thought fit to deſcribe as ſingularly myſterious, and they called it the Coup-de-Maitre, or cunning ſtroke! Such was the paltry device by which they reconciled their old faith with their new practice; they ſlipped in the knife, unobſerved by the ſpectators, and cut more than they choſe to confeſs; they ſatisfied their conſcience, by performing ſomething like the right operation, and ſaved their reputation by appearing to perform the wrong one; they affected that myſterious dexterity which profeſſed lithotomiſts have found ſo profitable in all ages.

Among the moſt conſpicuous of this neutral corps was the famous Le Cat, a lithotomiſt of Rouen, in Normandy, whoſe writings develope all the principles of thoſe who profeſſed the apparatus major. He was a man of as ſingular defects and excellencies, as ever fell to the lot of one individual: he had as a polemical writer

rapid conceptions, addreſs in argument, and a neat and eloquent ſtyle; talents for mechanical inventions he certainly poſſeſſed, and he had an unbounded paſſion for curious inſtruments and complicated operations. But theſe excellencies were counterpoiſed by defects of a moſt dangerous tendency: he was ambitious of being regarded as an original inventor, and would not condeſcend to perform an operation which was not peculiarly his own: his notions on the moſt important points in ſurgical pathology were very perplexed, and his correct knowledge of anatomy he perverted to the moſt abſurd purpoſes: he was altogether defective in ſenſe, ſteadineſs, and ſound judgment: he perſiſted in operating, during all his life, with knives of the moſt uncouth forms and an apparatus extremely complicated, and which he was changing from day to day: he was ſo infatuated, that when his friend and kind maſter, Morand, after returning from England, put the ſimple knife of Cheſſelden into his hand, and taught him to uſe it, he ſaid it was naught, and returned to his own crooked armoury: he perſiſted in proving, very eloquently, that dilatation was the moſt commendable way of operating, after the conviction had come home to his own mind, that inciſion alone was ſafe! after it had become indeed his practice! for he actually divided the proſtate, and that movement of the lithotome or knife, which others called the Coup-de-Maitre, he named *le debridement du Col de la Veſſie*, the unbridling of the ſphincter.

Thus it was the fate of a man of talents to write volume after volume, without making one convert, and to cut hundreds, by an apparatus ſo ingeniouſly complex, that he never prevailed, during all his life, on one lithotomiſt, pupil, ſurgeon, or even quack, to adopt his operation.

To explain the complicated operation of Le Cat, belongs (if indeed ſo extravagant an operation can excite any intereſt) to another ſubject. His doctrines, more intereſting, may be told in a few words: they have an intimate relation to the ſentiments of the other great lithotomiſts of his time, and eſpecially to the opinions and practices of the celebrated Le Dran. The myſterious doctrine of the dangers ariſing from wounds of membranous parts, is his chief and favourite theme, and it is mortifying to obſerve how little good faith is to be looked for, when a favourite doctrine is to be maintained, how trivial an argument, how ſlight an authority, how imperfect an analogy, will ſatisfy the dogmatiſt who would rather eſtabliſh his own favourite theory than diſcover truth. Little acquainted with general pathology, the theoriſts of the laſt age confounded the dilatation of parts with their growth, and maintained, that parts may be dilated without violence, becauſe they grow by nature. The

firſt leading analogy they fell upon, was that of the womb, which is in the pregnant ſtate dilated (as theſe theoriſts ſay) to an enormous ſize.—No! it is not dilated, it grows, there is a real increaſe of matter both in the contents of the veſſels and in the ſolid ſubſtance of the womb, which increaſe of matter is, after delivery, very ſlowly evacuated or abſorbed: Le Cat might as well have adduced the growth of the fœtus from an inviſible ſpeck to a luſty child, as an inſtance of dilatation! Yet from ſuch inſufficient proofs did the defenders of the old operation deduce this concluſion, that nature had ſet no limits to the dilatation of membranous parts, as the bladder of urine, the hollow viſcera, and the uterus *.

"The dilatability of the hollow organs," ſays Le Cat, "is moſt conſpicuous in their orifices, as is exemplified in the orifices of the bladder and womb." Le Cat and other ſupporters of the ſyſtem of dilatation reaſoned, as if there exiſted a real analogy betwixt the orifice of the womb, deſigned by nature for the moſt perfect dilatation, (viz. that neceſſary for the delivery of the child) and the orifice of the bladder plainly intended by nature, for the moſt perfect and cloſe contraction, ſuch as is neceſſary for retaining the urine! indeed the cloſeneſs of this orifice is ſuch as to reſtrain the urine, although continually preſſed by a ſlight action of the bladder, by the preſſure of reſpiration, and by the weight of the incumbent viſcera; and this orifice which is permanently in a ſtate of the cloſeſt contraction, never, even during the momentary efflux of the urine, ſuffers any but the ſlighteſt dilatation. Such analogies, ſo abſurd and inconcluſive, muſt ſurpriſe any man of ſound ſenſe and judgment, but what muſt be his reflections when he firſt perceives that a theory ſo extravagant as this is deſigned as a vindication of the moſt cruel and unnatural practice? when he finds thoſe theoriſts preſuming to put their horrible operation of tearing the neck of the bladder, on a parallel with the natural dilatation of the womb. The extravagance of ſuch reaſoning never ſtartled thoſe theoriſts, nor did the cruelty of the propoſed innovation alarm them; they meant, bonâ fide, to dilate the neck of the bladder, ſo as to permit the ſtone to paſs, in women, without any previous

* *Principes de la théorie de la Taille, neceſſaires au parallele des deux methodes propoſées.*

PROPOSITION I.

Les parties membrano-nerveuſes, peu muſculeuſes, telles que la matrice, la veſſie, &c. ſupportent les plus grandes dilatations ménagées ſans accidens. J'appelle dilatation menagée celle qu'on fait peu à peu, par degrès, en étendant les fibres, ſans les rompre.

Les preuves de cette propoſition ſont ſans nombre. La groſſeſſe eſt une démonſtration journaliere de la dilatabilité de l'utérus. La veſſie ne le cede point à l'utérus par cette proprieté.

inciſion, and in men, with only the outward inciſion of the ſkin and muſcles. They did not ſcruple to lay down this rule in the moſt deciſive terms, but plainly and openly avowed it as their belief, that "*the bladder, like the womb, was capable of this ſort of childbirth* *." The errors of Le Cat, an able but ignorant man, may be excuſed; far from being capable of eſtabliſhing analogies or reaſoning on pathology or the theory of ſurgery, he ſeems ſo ill inſtructed in logic that his proof of thoſe two parts being equally capable of dilatation becauſe they are both orifices, muſt remind us of the parallel attempted by Fluellin, betwixt Macedon and Wales: "If you look now in the map of the 'orld, I warrant you ſhall find, in the compariſons between Macedon and Monmouth, that the ſituations, look you, is both alike; there is a river in Macedon, and alſo moreover, a river at Monmouth: it is called Wye, at Monmouth; but it is out of my prains, what is the name of the other river, *but it is all one, they are as like as my fingers is to my fingers.*" The celebrated Dr. Hunter, as he was a man of learning as well as genius, was leſs pardonable, when he inferred the dilatation of the pelvis during labour, from the dilatation of the womb in labour; for, in order to prove that the dilatation of the womb, and that of the circle of the pelvis were equally natural, he ſhould have to proved that they were both orifices, and both equally narrow at the commencement of labour.

That their theory might ſeem leſs prepoſterous, and their practice not unnatural, they undertook to prove, that they were, in fact, but repeating a very uſual operation of nature, ſince women often paſs ſtones of very great ſize, without any help; and that great lithotomiſts have, upon the authority of this fact, operated on women, by the apparatus major, (i. e. by mere dilatation, by thruſting the dilator through their ſhort urethra into the neck of the bladder,) without uſing the knife †.

From theſe miſconceived analogies of the bladder, and of the womb, and the

"* Proposition II.

"La dilatabilité des organes membrano-nerveux qui ont la forme d'une bourſe, eſt plus conſidérable à leur orifice qu'en aucun autre point de leur ſurface.

"Cette propoſition eſt prouvée par les faits dans les deux organes qui viennent de nous ſervir d' exemples. L'orifice de l'utérus naturellement très etroit, ſe dilate dans l'accouchement juſqu' à laiſſer paſſer un enfant. Les obſervations nous aprennent que la veſſie eſt auſſi capable d'une eſpèce d'accouchement."

† "L' uréthre des femmes ſe dilate extraordinairement," dit la Vauguion, dans ſon Traité des Opérations, p. 118.; "ainſi il arrive rarement qu'on ſoit obligé de leur faire opération."

Nuk, dans ſon Traité des Operations, p. 138, s'exprime de même. Dionis, p. 237., eſt auſſi pour la taille des femmes *par dilatation*, qu'il appelle le petit appareil, et il aſſure que leur uréthre eſt dilatable au dela de ce

imaginary reſemblance of the organs in both ſexes, this cruel doctrine was inferred; that the cervix veſicæ ſhould be dilated in true conformity with the operations of nature * in like caſes. "That nature muſt be correctly imitated, which to facilitate the paſſage of the child dilates the womb ſlowly; and, by intervals correſponding with thoſe of the pains of labour; ſuch, of courſe, ſhould be our method of dilating the urethra ſlowly and gently."

Le Cat having tranſcribed this extravagant notion from Le Dran, exclaims in raptures, † "Is not this admirable ſurgery! I do confeſs that I no ſooner read the ſentence than I ſent the diſcourſe to M. le Blanc, enchanted to find my ſentiments correſponding ſo expreſsly with thoſe of that celebrated ſurgeon."

But when theſe theoriſts had arrived at the end almoſt of their career, an obſtacle, of no little importance, preſented itſelf to their imagination; viz. the difference in the organs of the two ſexes. "Nature, we muſt avow it," ſays Le Cat, "has ſet bounds to this dilatation in man, by the firmneſs of the proſtate gland, with which nature has encircled and fortified the entrance of the bladder. Yet even this gland, and its follicules and ſinuſes, are ſuſceptible of dilatation in ſome degree; and the lithotomiſt, when he ventures to undo this obſtacle, by a ſmall inciſion in the proſtate, makes way for a free dilatation of the bladder itſelf ‡." Thus their proud theory of dilatation ends plainly in inciſion, and the dividing of the proſtate gland, which others named, "Coup de Maitre," is named by Le Cat and Le Dran, "Débridement du Col de la Veſſie;" thus did they deceive themſelves and impoſe on others by a change of names.

qu'on peut croire. M. de la Faye, dont le Commentaire ſur ce livre eſt imprimé en 1740, eſt du même ſentiment, et ne decrit pas une autre méthode.

"Les femmes pierreuſes," dit le celèbre Heiſter, "ſont ordinairement plus heureuſes que les hommes, en ce qu' elles peuvent ſouvent être delivrées de la pierre, ſans être expoſées à une inciſion dangéreuſe, et qu'une ſimple dilatation de l'uréthre, ou du col de la veſſie." &c.

* "On peut ſe diſpenſer de faire aucune inciſion, et il faut imiter, autant qu'il eſt poſſible, la nature, qui, pour faire paſſer un enfant par le col de la matrice, l'écarte peu à peu, et a diverſes repriſes, à l'aide des douleurs que la femme reſſent. *Il faut donc faire prêter de même uréthre et le cou de la veſſie peu à peu, et ſans trop les forcer.*"

† "Voilà ce qui s'appelle de la bonne chirurgie. J'avoue que je n'avois point lû cet endroit, quand j'ai envoyé cette diſſertation à M. le Blanc, et que j'ai été enchanté de me rencontrer ſi juſte, comme on la verra à l'article de la théorie, avec un praticien auſſi conſommé que M. le Dran."

‡ "La nature paroit avoir voulu mettre des bornes à cette dilatation dans l'orifice de la veſſie, par la proſtate, corps glanduleux et ferme, dont elle a muni la partie antérieure de cet orifice. Néanmoins la gouttiere des lobes de cette glande, les follicules mêmes de ces lobes, ſont ſuſceptibles de beaucoup de dilatation, *mais le lithotomiſte qui a encore l'intention d'inciſer l'une de ces barrieres, ouvre par-là une voye libre à la plus ample dilatation.*"

There wanted but one argument more to complete the proofs of Le Cat's doctrine; viz. that he ſhould be able, after ſo many bad arguments, to adduce ſome unlucky operations done with the knife; this was perfectly eaſy, he had but to make the experiments himſelf, and with his own knives, and even this he condeſcended to do in compliment to his favourite theory. It will be recollected that his kind maſter, Morand, had, upon his return from England, put the knife of Cheſſelden into his hand, but Le Cat refuſed his inſtructions; he did indeed, perform the operation of Cheſſelden, (not with Cheſſelden's knife but his own,) unwillingly, and aukwardly, no doubt, on nine patients, in the Hotel-dieu; of theſe nine patients ſix died, and this infatuated man ventured to produce publicly, the ill ſucceſs of his own mal-adroit operations, as a proof of the danger of wounding the neck of the bladder! there was no contending with one who could bring ſuch damning proofs *.

Le Cat, by all his reaſonings and experiments, imagined that he had eſtabliſhed the following concluſions: that wounds of membranous parts were mortal, and that dilatation of membranous parts, as of the urethra, bladder, womb, is ſafe if ſlowly performed: That ſince dilatation is leſs dangerous than inciſion, that which is leſs dangerous ſhould predominate, we ſhould make our way therefore into the bladder more by dilatation than inciſion: That, in ſhort, lithotomy ſhould conſiſt of inciſion and dilatation combined; little inciſion, much dilatation, and no laceration. Such are the definitions and principles of his own peculiar operation, which, if not directly announced in any one paſſage, may, at leaſt, be collected from his illuſtrations and reaſonings.

But my reader cannot be without ſome deſire to know what the words were of this boaſted aphoriſm, by which thoſe innovators maintained their theory of wounds in membranous parts being mortal. Hippocrates ſays, in his 18 Aphor. ſect. 6. "VESICA DECISSA, AUT CEREBRO AUT CORDE EST LETHALE."—What is this? Is it authority for avoiding or preferring any thing particular in lithotomy? by no means; it is merely a general prognoſtic concerning the danger of wounds of the viſcera; and whoever had made himſelf acquainted with the writings of Hippocrates,

* "L'inciſion intérieure coupoit le dedans de la proſtate, le col de la veſſie, et environ un grand pouce, ou un pouce et demi de ſon corps. Elle n'intéreſſoit, ni le rectum, ni aucune autre partie reſpectable. Confirmé pas ces eſſais, je me reſolus d'ajouter ce nouveau degré de perfection à notre méthode.

"Le 7 Mai 1735, je taillai avec ces inſtrumens quatre ſujets en huit minutes; le premier Juin, cinq autres avec la même aiſance: de ces neuf ſujets, quatre ſont morts dans la huitaine, deux après la quarantaine."

Anatomy of the Apparatus Major.

Page 77.

Fig. 1st.

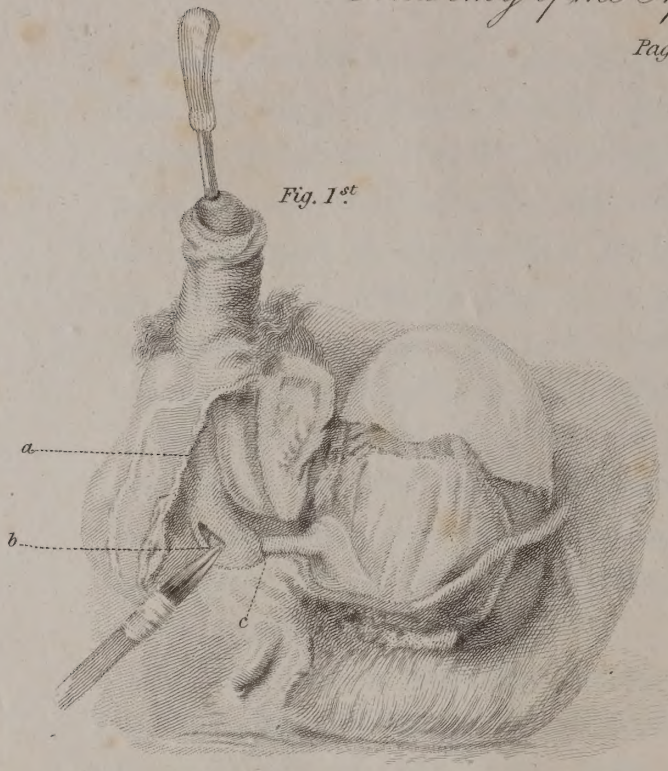


Fig. 2nd.

Fig. 3d.

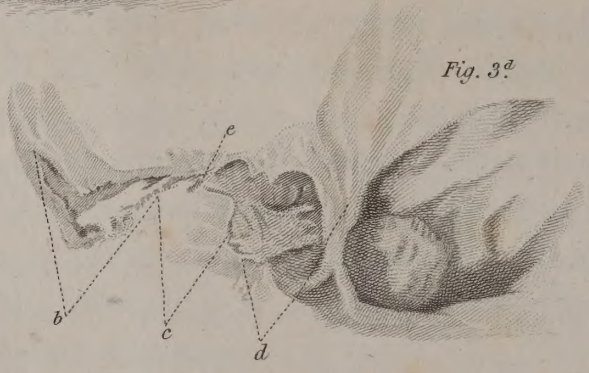


Fig. 4th.

Fig. 5th.

Drawn by I. Bell.

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Engraved by E. Mitchell.

or remembered the promiſe he exacted of his pupils, never to cut for the ſtone, might have predicted that thoſe who ſearched into the works of Hippocrates for authority on ſuch a ſubject, would be obliged to content themſelves with ſome vague and general text. This is the ſole authority that Le Cat has ventured to quote: after ſome abortive attempts to reconcile the practice of Celſus, who directs deep inciſions, with the ſuppoſed precept of Hippocrates about membranous wounds, he concludes his reaſoning with an argument unanſwerable in his days, and requiring no anſwer in ours. "Toute l'antiquité a ſuivie ces grands hommes."—"All antiquity," ſays Le Cat, "has followed theſe celebrated men," and he intended no doubt, that all poſterity ſhould follow in the ſame path.

Theſe are not unimportant debates; every theory in ſurgery involves (as this certainly involved) the lives of thouſands; and the manners, the learning, and the operations of the profeſſion, in that age, may afford uſeful leſſons to modern times.

ANATOMY OF THE APPARATUS MAJOR.

Let us, in order to profit by the miſtakes of our predeceſſors, put this operation alſo to the teſt of anatomy.

Firſt, as it was the deſign of theſe learned lithotomiſts not to cut, but dilate the bladder, their inciſion did not paſs the anus or tuber iſchii; did not extend to the hip; did not lay open that great hollow by the ſide of the rectum, in which the neck of the bladder is felt by the finger, and through which alone, the ſtone can paſs eaſily: their inciſion hardly reached the anus, it hardly extended indeed beyond that point where ours begins: they cut only the perinæum where the bulb of the urethra lies: they did not penetrate to the neck of the bladder, they ſlit up merely the bulb of the urethra, from (a) to (b), fig. 1.: their inciſion ſeldom extended to (c); the danger of wounding membranous parts was the main theory of their operation, wherefore they reſerved the membranous part of the urethra along with the neck of the bladder, to be torn, by the force of dilators *.

* In the *grand apparatus* the *urethra* is cut by the lithotome at its *bending*, and the inciſion ends *almoſt an inch and a half on this ſide the proſtate*. What compoſes the reſt of the ſtone's paſſage is the bulb of the urethra, which is *aponeurotic*. Le Dran.

"Ce qui me fait croire que la plus grande difficulté qu'ont les plus habiles lithotomiſtes à tirer la pierre, vient moins ſouvent de la part du col de *la veſſie, que de la part de l'uréthre*, parce que ne coupant l'uréthre, comme ils

That the membranous part, the narroweſt and moſt delicate part of the urethra, ſhould be dilated without being torn! dilated, ſo as to allow the ſtone and the great forceps to paſs along the canal, is a thing ſo incredible that there cannot remain the ſmalleſt doubt that by thoſe who operated with the apparatus major, it was lacerated to very rags and tatters! And after it was ſo laceratd, the ſame dilators were advanced deeper into the neck of the bladder, and new lacerations begun.

Now, it is neither the needleſsly ſlitting up of ſo great a length of the urinary canal, nor the extenſive wound of the bulb, nor the profuſe hæmorrhage from its cavernous body, that we have to remark; but this was particularly lamentable, that the urethra being torn to rags in this way of operating, never could regain its form, but waſted in ſuppuration, ſo that the patient had an incurable fiſtula, with impotency, the urine and ſemen iſſuing by the perinæum.

Secondly, the new lacerations here mentioned above, are thoſe of the neck of the bladder and proſtate gland; and to conceive truly of the effects of this ſecond dilaceration, we muſt reflect on the ſtate of the parts. The urethra is truly repreſented in fig. 2. lacerated at (a), torn even to the apex of the proſtate gland; Le Dran, himſelf the ſupporter of the apparatus major, confeſſes, on various occaſions, that this membranous part is incapable of dilatation, that it tears when forced by the conductors; that it is rent on that ſide which lies againſt the rectum *. Imagine then this delicate part of the urethra, rent as repreſented at (a): the male and female conductors (b and c) paſſed through the ring or ſtricture of the urethra into the bladder: imagine the handles of thoſe conductors farther diverged from (b c) to (d e): imagine the dilator, the gorget, or the forceps, wedged in betwixt them for the purpoſe of completing the dilatation, and you will be able to predict what muſt happen. It is impoſſible to uſe much force in one direction, without its operating (eſpecially among ſoft and moveable parts) in all directions! it is impoſſible to dilate, or attempt to dilate the gland, without puſhing it back! and when the gland is thus forced back into the pelvis, while the urethra, already lacerated and incapable of

ſont, qu' au devant des os pubis; et le col de la veſſie étant placé au derriere de ces os, il *reſte d'ordinaire ſous l'angle qu' ils forment par leur union, un pouce ou environ du canal de l'uréthre qui n'a point été coupé à traverſer.* Or ce canal étant plus étroit que le col de la veſſie; il y a donc bien plus d'apparence que la difficulté qu' ont tous les lithotomiſtes à tirer la pierre, vient moins de la part du col de la veſſie que de celle de l'uréthre." Mery, page 68.

* Whichever of theſe methods is choſen to make the dilatation, it cannot be accompliſhed without opening the whole canal along the ſide of the rectum. *Le Dran.*

reſiſtance, is retained by its connexion with the pubis, what can ſave it from being entirely ſeparated from the bladder? The diverging of the conductors, the driving in of the gorget, the ſtrokes of the dilator, the ſtretching of the chops of the forceps, all tend to ſeparate the bladder from the urethra; even the boring the finger into the firm ring of the proſtate, might occaſion this ſeparation: in a long and violent operation with the apparatus major, it is merely impoſſible that this part of the urethra ſhould eſcape.

Thirdly, this terrible conſequence of the ſecond laceration is demonſtrated by the third drawing or ſcheme, which repreſents truly the condition of the parts. The bladder is repreſented as open, and the ſtone (a) is ſeen in it, lying near the neck. The bulb (b) is ſlit up by the inciſion of the knife; the inciſion is continued in the laceration (c), which extends the whole length of the membranous part of the urethra; the laceration (d) of the proſtate, the part next in ſucceſſion, is repreſented, as it always muſt have been, very irregular; and the almoſt total ſeparation of the urethra from the bladder is repreſented at (e), where only a few threads and fibres of the cellular ſubſtance are ſeen remaining entire. Nor is this hypothetical merely, the fact is proved by every kind of evidence. In all the experiments of Le Dran, who diſſected bodies to diſcover the conſequences of each method of operating, the proſtate gland was found (when he dilated with the apparatus major) to be ſevered from the urethra, by the labouring with the dilating inſtruments: All the reports of Mery, Le Cat, Saviard, and others, who diſſected thoſe who had died after the operation of the apparatus major, confirm the fact. The proſtate gland was as fairly ſeparated from the urethra, by the violence of this rude dilatation, as when the urethra was cut acroſs by Frere Jaques, and others, who operated by the gripe without a ſtaff: nor is there one writer in favour of the apparatus major, ſo diſhoneſt as to deny that incurable fiſtulas were the frequent conſequence of it; even Le Dran confeſſes it in theſe terms: "It is likewiſe true that ſome patients have remained fiſtulous; but this never happens but in two or three caſes, as when there *has been a very great dilaceration;* when to extract large pieces of a broken ſtone, or to make a diſtempered bladder ſuppurate, they have been obliged to leave a cannula long in the bladder; or in fine, when the patients have been much waſted during the courſe of their cure."

Fourthly, If there was difficulty in getting into the bladder, by the dilating inſtruments of the apparatus major, there was ſtill greater difficulty in extracting the ſtone. The eaſy extraction of the ſtone depends not on the free inciſion of the proſtate

bladder, or other internal parts, but on the proper diſſection of the external parts, for which there is one great and invariable rule.—"To cut fairly acroſs the tranſverſalis or triangular muſcle which bars the perinæum," a ſhort inciſion, ſuch as was uſed in the apparatus major, an inciſion, I mean, which falls ſhort of the middle point, betwixt the anus and the tuber iſchii, is not only inſufficient as it is ſhort, but undilatable, as it is bounded by the tranſverſe muſcle, ſtill undivided. In the old operation, their outward inciſions were made almoſt as timorouſly as their internal inciſions; and the delivery of the ſtone, when actually ſeized by the forceps, was a third ſtage of dilatation more difficult than even the introduction of the dilators; for, with the dilators, the comparatively delicate parts, the urethra and neck of the bladder alone, were forced, but with the forceps, the muſcles of the perinæum, which can hardly be made to yield, were to be dilated.

This point, which bears perhaps a more intereſting analogy to our modern operation than any other circumſtance of the old one, I have thought it right to illuſtrate by figures 4, and 5., where both the place and the effect of this inciſion are clearly expreſſed. The inciſion, in numb. 4., is the true inciſion of the old lithotomiſts, and ſuch as but too many modern ſurgeons are apt to make; it hardly paſſes the anus, or paſſes it ſuperficially in the ſkin, while the parts within are not divided, and the perinæum continues bridled and conſtricted by the tranſverſalis perinæi (a), fig. 5. The inciſion reaches that part (b) of the great hollow oppoſite to which the membranous part of the urethra lies, but not the part (c) of the cavity of the pelvis, oppoſite to which lies the neck of the bladder and body of the proſtate.

I will take this fair anatomical ſcheme, as my warrant for affirming, that if the apparatus major was, as Heiſter ſays, "A baſe and ſelf-intereſted invention!" it was, at the ſame time, the moſt cruel and horrible that ever entered into the heart of man to conceive; the proofs of this may be found in every circumſtance already related.

This laborious, and ſometimes unſucceſsful operation, laſted not unfrequently for an hour, amidſt the agonies of the patient and the ineffectual ſtruggles of the ſurgeon. The greateſt maſters aſſure us, that the chief difficulty lies in dilating, and the moſt conſummate in this art of dilating, dilated ſlowly, fibre after fibre, till the finger, or the forceps, could be admitted into the ring or ſtricture of the gland. Collot, and thoſe who affected to perform the moſt perfect operation, regarded the right management of the dilator, as the chief ſecret in lithotomy, and accuſed the igno-

rant of tearing, only becauſe they knew not how to dilate, fibre after fibre. Le Dran, with the perfect compoſure of a philoſopher, calculates the degree in which the dividing of the points of laceration, by dilating ſlowly, leſſens the pain. "The inciſion of the urethra is," he ſays, "unqueſtionably prolonged into the neck of the bladder, but every line of the canal is ſeparated one after another, and thus *one very acute pain is divided, into ſo many leſſer pains as there are points of dilatation.*" Such ſophiſms were but ſlender conſolations to thoſe who were thus put to the rack, "for who can hold a fire in his hand, by thinking on the frozen Caucaſus." To all their cold-blooded apologies for this cruel dilatation, the plain words of Dionis give the lie; he was himſelf an operator with the apparatus major, yet could not find in his heart to diſguiſe the truth; "It muſt be acknowledged," ſays Dionis, "that while we give thoſe two ſtrokes of the dilator lengthways, and croſsways, we hear the patient redouble his cries, and cannot but be ſenſible of the pains he ſuffers, and of the propriety of refraining from the uſe of this inſtrument as much as poſſible." *

Morand had alſo been an operator with the great apparatus; but having been deputed, by the French academy, to go to England and learn the operation of Cheſſelden, it became his intereſt, after his return, to diſcloſe the ſecrets of his hoſpital, and this is the authentic and melancholy record.

Authentic liſt of the operations in the Hoſpital of La Charité.

Anno 1731,	14 *cut for the ſtone*	8 *died.*
1732,	11 *cut for the ſtone*	4 *died.*
1733,	16 *cut for the ſtone*	8 *died.*
1734,	17 *cut for the ſtone*	9 *died.*
1735,	13 *cut for the ſtone*	9 *died.*
Total,	71 *cut for the ſtone*	38 *died.*

Such was the iſſue of this operation when performed in La Charité, by Mareſchall, Morand, and others, the firſt maſter ſurgeons of Paris, a city where the place of hoſpital ſurgeon having been always filled by the moſt eminent anatomiſts, operations

* "Et véritablement dans le tems qu' on donne les deux coups du dilatatoire, l'un en large et l'autre en long, on entend le malade redoubler ſes cris; ce qui prouve l'exces du mal qu' il reſſent pour lors, c'eſt pourquoi on conſeille de s'en ſervir le moins qu' on pourra."

have been performed in a manner which, till the time of our great anatomiſt Cheſſelden, never had been excelled.

Who the perſon was who publiſhed the works of Collot, I know not; but he in publiſhing the hiſtory of the apparatus major, as it was found in the cloſet of old Collot, would not ſurely dare to traduce the firſt ſurgeons of France, nor obtrude upon the world untrue reports from thoſe hoſpitals in which all the ſurgeons of France had learnt and practiſed their profeſſion. He ſpeaks, in his preface, like one who had felt all the horrors of this operation, and called upon the public to witneſs the truth of his reports. "The ſmall proportion of patients," ſays the editor, "who ſurvive this operation, will render it for ever formidable! of twenty, cut by the apparatus major, not five are ſaved! and thoſe who do ſurvive paſs a melancholy life, for fiſtulas and incontinence of urine are the uſual conſequences of the inciſion."—"Look but to the books of La Charité," ſays this anonymous editor, "and you will find almoſt all the patients dying in a few days: in the year 1725, of twenty cut for the ſtone, five only ſurvived! The farther we ſearch into theſe regiſters, the more fully ſhall we be perſuaded that there is no period which is not marked with the ſame mortality, nor do the regiſters of the Hotel Dieu, afford us the ſlighteſt conſolation *."

How greatly thoſe deaths were aggravated by the manner of them, it is eaſy to conceive. The ſcene exhibited in a great hoſpital was terrible, where all kinds of dilators were at hand, and were freely uſed; where very often, as Le Dran confeſſes, the operator laboured with a degree of violence in which the ſafety of his patient was *not* the principal object, "where vanity ſuggeſted to the operator, the deſire of finiſhing his operation almoſt as ſoon as it was begun." Sometimes the operator attempted to ſucceed by ſeparating the handles of the conductors, or boring his finger between them: ſometimes by driving in the gorget through the proſtate gland: ſometimes by working with his finger in the hollow of the gorget, and turning and twiſting it, to enlarge the opening: ſometimes, by driving the forceps rudely along the cavity of the gorget, or betwixt the handles of the conductors, and, twiſt-

* "Le petit nombre de ceux qui ſurvivent à cette opération la rendra toujours redoutable; de vingt malades à peine en ſauvent-ou cinque ou ſix; l'opération même ne leur laiſſe qu' une vie triſte; l'écoulement d'urine les fiſtules ſont les ſuites frequentes de l'inciſion." page 12.

In another paſſage, page 42. of the preface, the editor ſays, "Qu' on conſult les regiſtres de La Charité, on verra que preſques tous les taillez meurent dans peu de jours; en 1725, de vingt qui ſe ſont livrez à l'opération il n' en reſte que cinque! en remontant plus loin, on trouvera chaque année marquée des mêmes: malheurs l'Hotel Dieu n'offrira pas des moindres ravages."

ing, turning, and ſeparating their handles, that they alſo might ſerve as dilators. But when all failed, and the operator was forced to quit his hold of the ſtone, and uſe the proper dilator, when he made ſucceſſive ſtrokes with this inſtrument, firſt longways and then acroſs, the tortures of the patient were not to be endured, and notwithſtanding "the diviſion of this acute pain into ſo many leſſer pains," the halls of the hoſpital reſounded with his cries! Yet why ſhould I attempt to repreſent a regular ſucceſſion of dilatations or of inſtruments, ſince the inſtruments were uſed promiſcuouſly? ſince, notwithſtanding the art which ſome affected, their dilatation was one continued ſcene of confuſion and violence! Every one had his own peculiar and boaſted method of lacerating the parts. *

Let the modern lithotomiſt, if any one aſſuming the name of lithotomiſt ſhould condeſcend to read this analyſis, reflect on the cruelties of paſt times; let him aſk himſelf this queſtion, have I never performed an operation too nearly reſembling this in its defects, in its conſequences? are there no uſeful leſſons to be deduced from this relation of the cruelties committed in former ages? I fear there are few modern operations free entirely from the cruelties imputed to the apparatus major.

Firſt—let it be obſerved, that neither the paſſing down of the ſtaff into the bladder, nor any other circumſtance, can entirely ſave the urethra from the knife or forceps of a bad operator! The nick in the urethra, which ſhould be made at once, and decidedly, is often done by a timid or awkward man at ſeveral ſucceſſive ſtrokes; he cuts, lays down his knife, lifts it and cuts again; and thus, by ſucceſſive croſs-inciſions, he ſo mangles the urethra as almoſt to divide it from the proſtate gland, and render it incapable of withſtanding the puſh, even of the ſharp or cutting gorget.

Secondly—that the modern lithotomiſt, by not opening the urethra freely with the knife and by uſing a narrow bladed and conical gorget, often cuts the proſtate gland ſo imperfectly that it admits the forceps with difficulty, and in puſhing in the forceps, the mangled urethra gives way.

* The heavy work they had in dilating the parts may be underſtood by the following quotation from Pallas, who reports no more than what he had himſelf ſeen in the hoſpitals of France: "Quando adhuc ad priora impedimenta major accedit calculi moles, maxima eſt partium læſio. ad quam educendam non varo pluriam etiam brakentium hominum auxilium deſideratur." An operation ſuch as this can be likened to nothing ſo properly as the deliveries with hooks related by La Motte and other accouchemens of the laſt age, in France, who ſometimes came upon the country ſurgeons rather ſuddenly, when the crotchet being fixed into the head of the unborn child, the maſter was pulling by the hook, and the ſervants and apprentices pulling by the maſter, I have had the advantage of ſeeing ſuch *examples* both in lithotomys and accouchemens.

Thirdly—ſometimes I am perſuaded it happens, that the proſtate being thus ſevered from the urethra, in the modern, as in the ancient operation, or the gland imperfectly cut, the forceps not being properly paſſed into the bladder, are puſhed onwards betwixt the bladder and rectum, and the operator gropes for the ſtone, or actually ſeizes it in vain, the coats of the bladder being interpoſed betwixt the ſtone and forceps.

Fourthly—it is in this caſe only that the ſtone adheres. That a ſtone may adhere moſt perverſely to the bladder ſo as to be inſeparable by the power of great iron forceps, is a doctrine, which, however contemptible in the eye of reaſon, is reſpectable in point of antiquity: and the doctrine once eſtabliſhed by learned reaſonings and ſtill more learned quotations, was univerſally approved of for wiſe and uſeful purpoſes: for whoever profeſſed this doctrine could never be abaſhed, he had an apology for every miſadventure and the privilege of telling the friends and ſpectators of this operation, when the ſtone could not be extracted, that it adhered. Perhaps it will be well to declare once for all, in this place, the manifold cauſes of the adheſion of the ſtone. Among the older ſurgeons, in the time of the apparatus major, the chief cauſe of the adheſion of the ſtone was! an imperfect dilatation. And among the moderns, whenever the ſurgeon allows his ſtaff to ſlip out through the ſlit in the urethra, and lie betwixt the rectum and bladder! when he cuts the urethra ſo imperfectly, that the beak of the gorget never is admitted into the groove of the ſtaff! when, by puſhing in a wrong direction, or at too acute an angle, the beak of the gorget runs off from the groove of the ſtaff, and is lodged among the cellular ſubſtance of the rectum! when the forceps having been once in the bladder, have ſlipped from the ſtone, and been puſhed, in the ſecond attempt, betwixt the bladder and rectum! the ſtone infallibly adheres, for the bladder is betwixt the ſtone and the forceps. Theſe are, I believe, the true and veritable cauſes of the adheſion of the ſtone; before I could allow myſelf to write, in theſe terms, of a doctrine once well reſpected and as yet hardly relinquiſhed, I muſt have been reſolved, from reaſon and much experience, to treat ſo mean an apology with ſupreme contempt, as indeed it has been treated long ago even by Collot, who performed only the Marian operation. It would be difficult to ſay what kind of adheſion could ſubſiſt betwixt the human bladder and the ſtone; yet the doctrine is one which will always be held in reverence by bad operators, uncertain of the iſſue of their operations. Let them however beware of what once happened to the profeſſion. Lithotomiſts had, at one period, very nearly overſhot the mark! ſo ſtrongly had

they impreſſed this doctrine, and the fear of adheſion of the ſtone on all ranks and degrees of people, that thoſe even who were the moſt cruelly tortured with the diſeaſe, refuſed to be cut, leſt the ſtone ſhould adhere inſeparably to the bladder, and they ſuffer the pains of the operation in vain*.

Fifthly—of all the faults of the apparatus major transferred by bad operators to the operation of the preſent day, that of a limited inciſion is at once the moſt frequent and the moſt dangerous. The manner of cutting low upon the perinæum which ſhould be peculiar to the operation by the apparatus major was ſo long exhibited in public operations, that it has hardly been diſeaſed even in modern times: thoſe who had uſually ſeen the ſtone extracted by a ſmall inciſion, had not the ſpirit to deviate from the practice of the old ſchool, nor the boldneſs from principle unſupported by precedent, to make that long and deep inciſion which is alone ſafe. It is indeed to be lamented that ſurgeons do very often, like the ſons and nephews of Collot, follow the form and ſteps of a traditional operation which they have learnt and practiſed, not according to the rules of ſcience, nor by being perfectly acquainted with the deſign of the operation and the diſſection of the parts, but by imitating the motions they have ſeen performed by others! But, like the monkey imitating the operation of ſhaving, they have the ill luck ſometimes to turn their inſtruments the wrong way! Marianus and his followers made the inciſion for lithotomy, not over the hip, but along the perinæum! ſo ſometimes does the modern ſurgeon: Marianus and his followers bored in the finger along the gorget, for the purpoſe of dilating! ſo does the modern ſurgeon, though he has no ſuch purpoſe (viz. of dilating): Marianus and his ſect turned and wrought the forceps in the moſt unrelenting and cruel manner, for the purpoſe of compleating the dilatation! ſo does the modern ſurgeon, though his free inciſions ſhould enable him to refrain from this cruelty; he has indeed no deſign of dilating with the forceps, and merely performs certain manœuvres which he has ſeen practiſed by thoſe who preceded him, and which he unthinkingly imitates, without regarding the deſign or effect of what he does. Thoſe rude movements of the forceps, the moſt cruel torturing and dangerous part of the operation by the apparatus major, are continued to the preſent day; often we ſee the lithotomiſt twiſting and pulling "this way and that way,"—"çà et là," according to the expreſs directions of Paræus; it is a

* "L'idée terrible de l'adherence de la pierre, frappe et trouble ſi cruellement les malades, que pluſieurs préferent à la lithotomie le chagrin de périr dans leurs plus cuiſantes douleurs." *Tollet.*

method mightily affected by unſkilful ſurgeons, who think to demonſtrate, to the ſpectators, the difficulties of the operation and their own dexterity and coolneſs.

If indeed modern ſurgeons were conſcious that they had not divided the parts by inciſion, but were labouring to enlarge the wound by laceration with the forceps, according to the rules of the Marian operation; if they were guided by the theory of Le Cat, of "little inciſion and much dilatation," they could not have a worthier maſter than Paræus! but a juſt and well proportioned inciſion, according to the modern theory of lithotomy, ſhould prevent all ſuch difficulties: when, at any time, you ſee an operator ſtruggling with the ſtone, turning his forceps, and twiſting his body, fixing his ſturdy feet againſt a great operation table, then wiping the ſweat from his forehead, and affecting compoſure, amidſt the cries of his patient, and the pale and haggard looks of the ſpectators! be aſſured that he is performing a Marian operation, that his inciſion is too ſmall, that he has not eſtimated the ſtone and provided for its eaſy extraction, and that the dilatation which was accompliſhed among the old lithotomiſts by appropriate inſtruments, he is attempting with the forceps. When I have witneſſed ſuch an operation I have recollected the ſcenes of the Hotel Dieu and the deſcriptions of the apparatus major, and have thought, that were Collot to riſe from the quiet grave, he would believe he ſaw the ſurgeon performing his own favourite operation, deſpiſing the method of cutting the proſtate gland, dividing the muſcles of the hip, and other novelties, which began to be obtruded upon the world about the time of his death.

BIOGRAPHICAL SKETCH

OF THE

CELEBRATED FRERE JAQUES,

AND OF

HIS OPERATIONS.

It may be eaſily imagined that new and intereſting ſenſations were impreſſed upon the public mind, when, in the Hotel Dieu, where, for centuries, nothing had been exhibited but the lingering cruelties of the apparatus major, where profeſſed lithotomiſts laboured for hours, amidſt the outcries of the patient, to extract the ſtone! an operator appeared, daring beyond all belief, making light of that operation which had been regarded as the maſter-piece of ſurgery, who, without heſitation or fear, performed by inciſion what had hitherto been attempted only by the force of repeated dilatations! who boldly plunged his dagger-pointed knife into the hip, thruſt it home into the bladder, felt with it for the ſtaff, then enlarged his inciſion upwards and downwards, and in a few moments, extracted the largeſt ſtone.

Such a man was Frere Jaques, he firſt broke the ſpell of that renowned aphoriſm, which declares that wounds of membranous parts are mortal; and rouſed the learned lithotomiſts and phyſicians of Paris from their vigorous ſlumbers: though ignorant in the eyes of theſe learned phyſicians, he firſt taught them by his ſucceſs, how to explain that text of Celſus which lays it down as a ſelf-evident truth, that in operating for the ſtone, "it is ſafer to cut than to dilate."

"Of this celebrated hermit, alternately extolled by his friends and decried by his enemies, what ſhall we ſay? intrepid and fearleſs, his hand never trembled, nor did his courage faulter in the moſt unlooked for and perilous ſituations: modeſt, humble, covetous of nothing but glory, he preſented himſelf in our city, as one

ſent from heaven, to alleviate the ſufferings of his fellow creatures." * Eulogiums ſuch as theſe, pronounced by men of learning and genius, prove that he was regarded, for ages after his death, with particular reſpect; and thoſe eulogiums, repeated in all countries, mark the enthuſiaſm with which he was received. To us his friends and his enemies are alike indifferent, his diſpoſitions and his talents may now be truly eſtimated, and, to the memory of the man who invented that operation which we now prefer to all others, our profeſſion ſurely owes every mark of reſpect; nor is it a vain tribute that we pay to his memory when we enquire into the hiſtory of his life, for, from his method and the various changes it had undergone, even during his own life, may be deduced leſſons highly important to the modern ſurgeon.

"It were to be wiſhed," ſays Heiſter, "that we had a regular hiſtory of the life of this great lithotomiſt and of his proceedings."—He appeared in Paris in the month of Auguſt 1697, habited like a Recollet (a gang of mendicant barefooted friars of the third order of St. Francis) with this variation only, that in place of the ſandal of that order, he wore ſhoes, and in place of their cowl, he wore a hat: he had every appearance of ſanctity, ſimplicity, charity, and all the virtues belonging to the character which he aſſumed, and practiſed all the ſeverities of an aſcetic life: he took the name of Frere Jaques, and lived in Paris, the life of a hermit, ſubſiſting merely on bread and ſoups: he was ingenuous, modeſt, ſimple, and very poor, accepting of no other reward than a few pence to mend his ſhoes, and keep his inſtruments in repair †."

His name, he ſaid, was Jaques Beaulieu, of the village of Langſonniere, in Burgundy: that he had lived in the alms-houſe of Beſançon, where aged people and

* This elegant apoſtrophe I have tranſlated from Mauchart, who, notwithſtanding his ſcholaſtic manner and abſtruſe learning, proves himſelf a man of fervid genius. "De eo homine ermita famoſus rectum non licet ferri judicium, amicis eum tollentibus nimium adverſariis nimis elevantibus; manu ſtrenua ſtabili nec unquam intremiſcente intrepidus animo, nec ulla inexpectata re vel difficili commotus, ſobrius, ſpretor divitiarum, unius gloriæ cupidus, et quaſi miſſum a Deo ad levandas hominum miſerias ſe predicans literis commendatitiis venit Pariſios." *Mauchart*, page 315.

† "Dans le mois d'Août de l'année 1697, arriva à Paris une eſpèce de moine qui avoit l'habit de Recollet, avec cette différence ſeulement, qu'il étoit chauſſé, et qu'au lieu de capuchon il portoit un chapeau. Il ſe faiſoit appeller Frère Jaques, et il paroiſſoit ſimple et ingénu. Il étoit ſobre, ne vivant que de potage et de pain. Il n'avoit point d'argent, et ne demandoit que quelques ſols pour faire repaſſer ſes inſtrumens, ou pour faire raccommoder ſes ſouliers. Il s'étoit fait une réligion à ſa mode avec des vœux dont lui laiſſoit la liberté a ſon evêque de le diſpenſer quand il voudroit."

children are received: that there, and in various towns and villages of France, he had cut for the ſtone many times: he mentioned that he had lately travelled through the province of Burgundy, and he brought along with him many certificates of the cures he had performed. How he had learnt his operations or from whom, no one could tell; the ſecret was indeed too important to his ſucceſs to be freely diſcloſed: he reported, and it was received by the people, that he was inſpired with the gift of cutting for the ſtone; and, indeed, had he not claimed a direct inſpiration from heaven, he muſt have confeſſed ſome very humble ſource of inſtruction, for he performed other operations, and they were unfortunately the operations peculiar to quacks! Heaven had inſpired him with the talent for curing ruptures and fiſtulas, as well as that of cutting for the ſtone.

Jaques Beaulieu was, when he firſt appeared in Paris, about forty years of age; after living an irregular and idle life, he became impreſſed with the moſt ſincere ſentiments of humility and chriſtian charity; himſelf an enthuſiaſt, he had, in almoſt every city, excited the enthuſiaſm of the vulgar, who were faſcinated with his peculiar dreſs and manners, and knew no more of his hiſtory than he choſe to declare; but he could not eſcape the contempt of the learned, with whom a rude man affecting peculiar ſanctity, and pretending to inſpiration, was a character at once ſuſpicious and odious in the extreme, and every inquiry ſeemed to prove, that in courſing from city to city, and from province to province, he had the addreſs to gather up numberleſs certificates, by cutting promiſcuouſly all who offered, and leaving them again without remorſe. Such certificates were not refuſed by the friends of the patients who witneſſed only the ſingular dexterity with which he extracted the ſtone, but had he waited till the time of cure arrived, the magiſtrates of cities would not have teſtified his ſucceſs with ſo much enthuſiaſm *. He ſnatched at theſe certificates of ſucceſs, with the greedy precipitation of a quack, and often, as in Paris, while exhibiting his teſtimonials and boaſting of his cures, letters arrived declaring that his patients were all dead.

It is not to be denied that he learned his art and myſtery from a quack of the

* "Son talent étoit d'aller de ville en ville et de tailler tout ce qui ſe préſentoit, il quittoit auſſi-tôt ſes malades et les abandonnoit ſans ſe ſoucier des ſuites; et c'eſt la raiſon pourquoi il avoit tant de ceux qui avoient été préſens à l'opération, et qui pouvoient rendre temoignage de ſon addreſſe et de ſon habilité à tirer la pierre. Mais s'il eut attendu à les demander après la guériſon, ils n'auroient pas parlé avec tant d'éloge qu'ils faiſoient immédiatement après l'opération."

name of Pauloni. His parents who lived in the hamlet of Etendoue in Langſauniere, in the pariſh of Beaufort, were very poor, and he had no other education than being imperfectly taught to read and write. At the age of twenty-one years he became the ſervant of Pauloni, and followed him through France, during ſix years; when, Pauloni at length embarking for Venice, Jaques Beaulieu, either forſaken by his maſter, or unwilling to accompany him in ſuch a voyage, travelled back into his own country practiſing thoſe operations at which he had hitherto only aſſiſted.

He had thus continued long undiſtinguiſhed, by dreſs or manners, from thoſe who follow the ſame profeſſion. But about the age of forty years, he became impreſſed with the moſt enthuſiaſtic ſentiments of religion, and reſolved to devote his life to works of charity. Although not belonging regularly to any order, (or having taken vows from which his biſhop gave him a conditional diſpenſation,) he wandered over the provinces of France and arrived, at laſt, in Paris, aſſuming only the name and character of a hermit or religious man. His air of ſimplicity and piety was natural and unaffected; there are indeed appearances which a man may counterfeit, but his whole life, and he lived to ſeventy years of age, was one uninterrupted ſcene of ſelf-denial, while he gave, as is remarked by contemporary authors, continual and unequivocal proofs of his liberal and benevolent turn of mind.

After travelling through the provinces of France, he arrived at Beſançon, his native place; there he cut many poor people, with the happieſt ſucceſs, and ſome alſo of higher rank, among whom was one of the canons of the metropolitan church, who, in his zeal and affection for Frere Jaques, adviſed him to go immediately to Paris. He ſet out accordingly on this deſign, carrying with him commendatory letters from this clergyman to one of the canons of the church of Notre Dame, together with numerous certificates from the magiſtrates of the towns and provinces which he had viſited. "When he arrived in Paris he introduced himſelf at the hoſpital of La Charité, through Mr. Marechal, the firſt ſurgeon, but was grieved to find that the phyſicians of that hoſpital would not allow him to operate, though he had come to Paris with the ſole deſign of teaching a new and particular manner of cutting for the ſtone *. But the friendly canon had introduced Frere Jaques to De Harley, firſt preſident of the parliament of Paris, who became his

* Il ſe fit connoitre à La Charité par M. Marechal, premier chirurgien du roy, et trouva mauvais de ce qu'il ne vouloit pas le laiſſer tailler dans cet hôpital, etant venu exprés à Paris, diſoit il pour apprendre aux chirurgiens une maniere particuliere d'executer cette operation.

friend, and protector; and the intereſt of De Harley was of more avail than the introduction of Marechal.

We may obſerve, even from the firſt, a degree of reluctance, on the part of Mery, to become an impartial juror on this intereſting queſtion, whether this operator ſhould be received into the Hotel Dieu. Frere Jaques needed a protector, ſuch as De Harley; it was not without his expreſs command that Mery and the ſurgeons of the Hotel Dieu condeſcended to notice the claims of this unknown operator. "I received," ſays Mery, "on the 7th December, an order from Monſieur the firſt Preſident to attend, in the Hotel Dieu, an experiment of cutting a dead body for the ſtone, the ſtone to be put in above the pubis, the operation to be performed by Frere Jaques."

The firſt report preſented to the Lord Preſident, by Mr. Mery, was equally favourable to Jaques and honourable to himſelf; there is indeed ſo much zeal and warmth in his firſt approbation that we cannot but impute his after delinquencies, his falling off from ſincerity and truth, his relapſing into his old prejudices, and continuing to practiſe the old operation, to the jealouſies of a reſtleſs and angry ſet of lithotomiſts who ſeduced him and required of him a ſacrifice, to which a man of ſpirit and honour would hardly have known how to ſubmit; they impoſed upon him the diſingenuous and diſguſting taſk of retracting his firſt unqualified approbation, and of inventing apologies for calumniating an operator, whom in his heart he could not but approve.

REPORT OF M. MERY UPON THE FIRST EXPERIMENT OF FRERE JAQUES, IN PARIS.

"Having introduced into the bladder a round and ſolid ſtaff, without any groove * and of an unuſual form; he took a common knife, remarkable only for its length,

* "Ayant introduit dans la veſſie une ſonde ſolide exactement ronde, ſans rainûre, et d'une figure differente de celle des ſondes, dont ſe ſervent ceux qui taillent ſuivant l'ancienne maniere; il prit un biſtouri ſemblable à ceux dont on ſe ſert ordinairement, mais plus long, avec lequel il fit une inciſion au côté gauche et interne de la tuberoſité de l'iſchium, et coupant obliquement de bas en haut, en profondant il trancha tout ce qui ſe trouva de parties depuis la tuberoſité de l'iſchium, juſqu'a ſa ſonde qu'il ne retira point. Son inciſion étant faite, il

with which he made an inciſion by the ſide of the left iſchium, and, cutting with it obliquely upwards, he divided all the parts betwixt the tuber iſchii and the ſtaff, which he allowed to remain in the bladder: he cut ſo freely upon the ſtaff as to admit the finger into the bladder, along the finger he introduced an inſtrument which he called his conductor, as if to dilate the wound, and along the conductor he paſſed the forceps. Having introduced the forceps, he withdrew the conductor; upon finding the ſtone he withdrew the ſtaff alſo; and, having ſeized the ſtone, he drew it out with all imaginable eaſe, though almoſt the ſize of an egg."

"Upon diſſecting the body," ſays Mery, "in preſence of the phyſicians and ſurgeons of the Hotel Dieu, I found, by comparing the inciſion with the oppoſite ſide of the perinæum, that he had cut through ſkin and fat about an inch and a half in thickneſs; that he had then carried his knife betwixt the accelerator and erector muſcles, without wounding either; and that he had cut laterally through the whole length of the neck and half an inch of the body of the bladder."

"Two days after this experiment," ſays Mery, "I waited on my lord preſident to declare the facts, and preſent my report and judgment on the operation, and this was what I ſaid: It appears to me, my lord, that the operation of Frere Jaques is more favourable *with reſpect to the extraction of the ſtone* than that in common uſe, for a wound made thus in the neck of the bladder, will permit the ſtone to paſs eaſily,

pouſſa ſon doit par la playe dans la veſſie, pour reconnoître la pierre, et aprés avoir remarqué ſa ſituation, il introduiſit dans la veſſie un inſtrument, pour dilater la playe, et rendre par ce moyen la ſortie de la pierre plus facile. Sur ce dilatoire qu'il apele ſon conducteur, il pouſſa une tenere dans la veſſie, et retira auſſitôt ce conducteur, et aprés avoir cherché et chargé la pierre, il retira ſa ſonde de l'urethre, et enſuite ſa tenete avec la pierre de la veſſie, par la playe: ce qu'il fit avec beaucoup de facilité, quoy que la pierre fût à peu prés de la groſſeur d'un œuf de poule.

"Cette operation étant faite, je diſſequay, en preſence de Meſſieurs les medecins et chirurgiens de l'Hôtel-Dieu, les parties qui avoient été coupées. Par la diſſection que j'en fis, et en les comparant avec les mêmes parties opoſées que je diſſequai auſſi, nous remarquâmes que Frere Jacques avoit coupé d'abord des graiſſes, environ un pouce et demi d'épaiſſeur, qu'il avoit enſuite conduit ſon ſcalpel entre le muſcle érecteur et l'accelerateur gauche, ſans les bleſſer; et qu'il avoit enfin coupé le col de la veſſie dans toute ſa longueur par le côté, et environ demi pouce du corps même de la veſſie.

Deux jours aprés cette expérience j'allay chez Monſeigneur le premier preſident luy rendre conte de ce que nous avions obſervé, et luy dire mon ſentiment ſur l'operation de Frere Jacques. Voicy le raport que j'eus l'honneur de luy en faire.

"1° Monſeigneur, la maniere d'operer de Frere Jaques me paroît beaucoup plus avantageuſe pour l'extraction de la pierre, que celle qui ſe pratique ordinairement; parce que l'inciſion étant faite dans le col et le corps de la veſſie, et la pierre tirée par la partie la plus large de l'angle que forment les os pubis, elle peut ſortir avec facilité et ſans aucun éfort: mais dans l'operation ordinaire, comme on ne fait d'inciſion qu'a l'urethre; que l'on tire

and, being extracted through the wideſt part of the opening of the pelvis, it will be brought along without violence: whereas, in the common operation, there being *no inciſion but in the urethra*, and the ſtone being forced through the neck of the bladder ſtill entire, and through the narroweſt part of the arch of the pelvis, the operation cannot be accompliſhed without extreme difficulty, and (wherever the ſtone is large) with great *violence*."

"The concluſion then, my lord, is plain: *That the operation of Frere Jaques muſt be leſs liable to accidents than that in common uſe.* He cuts none of the muſcles of the penis, while the inciſion of the apparatus major divides the accelerator muſcles inſtead of the rapha. His inciſion divides only the proſtate and cervix veſicæ, which are ſupplied with none but ſmaller arteries, while the inciſion of the apparatus major ſlits up the bulb, the moſt cellular part of the urethra, and that into which the chief arteries of the penis pour their blood. His inciſion cauſes neither ecchymoſis nor ſuppuration in the ſcrotum. The inciſion of the apparatus major is in the perinæum, touching the ſcrotum while Frere Jaques makes his way into the bladder by an inciſion far diſtant from the ſcrotum."

"By this long and free inciſion in the neck of the bladder, ſufficient for the eaſy extraction of the ſtone, he ſaves the patient from that contuſion and laceration of the neck of the bladder, of the proſtate, and of the urethra, which are inſeparable

la pierre par le col de la veſſie qu'on n'a point coupé, et par la partie la plus étroite de l'angle que décrivent les os pubis par leur union; il eſt viſible que par ces endroits qui ſont fort étroits, on ne peut pas tirer la pierre qu'avec de grands éforts et une extrême difficulté, pour peu qu'elle ſoit groſſe: d'où il eſt aiſé de tirer cette conſequence, que l'operation que fait Frere Jaques, pour tirer la pierre hors la veſſie, ne doit pas être ſuivie d'accidens auſſi fâcheux, que ceux qui ſuivent de l'operation ordinaire. Premierement parce que par ſa maniere particuliere d'operer, il ne coupe aucun des muſcles de la verge: mais dans la commune on ſepare entierement les deux muſcles accelerateurs l'un de l'autre par l'inciſion que l'on fait dans l'endroit de leur union, qui eſt le lieu de leur origine. De-là vient que ces muſcles perdent ſouvent leur action.

"2° En faiſant ſon operation, il coupe à la verité le corps des proſtates, le col entier de la veſſie par le côté, et un peu de ſon corps; mais ces parties n'étant arroſées que par de petits vaiſſeaux, l'hœmorragie n'eſt pas tant à craindre que dans l'operation ordinaire, où l'on coupe toûjours la partie ſpongieuſe la plus épaiſſe du canal de l'urethre, dans laquelle les deux arteres de la verge déchargent une grande quantité de ſang.

"3° Son operation ne peut pas être ſuivie ni de l'échymoſe, ni de la fluxion, ni de la ſupuration qui ſe font fort ſouvent dans les membranes des bourſes, à l'occaſion de l'operation ordinaire; parce que l'endroit par où il entre dans la veſſie, n'a pas de communication avec le ſcrotum, comme en a le perinée que coupent d'abord tous les autres lithotomiſtes.

"4° Faiſant une longue inciſion au col et au corps de la veſſie, par la quelle il tire la pierre ſans peine, il évite la contuſion et le déchirement de ces parties, qui arrivent preſque toûjours au col de la veſſie, aux proſtates qui lui ſont jointes et à l'urethre dans l'operation commune, pour peu que la pierre ſoit groſſe & ſa ſurface ra-

from the old method. After his inciſion, the parts muſt unite more eaſily, and fiſtulas muſt be leſs frequent than in the common operation, where the violence is ſuch that there is, from ſuppuration, an actual loſs of ſubſtance, which endangers fiſtulas and prevents the cure: *whether ſuch wounds of the neck and body of the bladder are not really fatal, as has been hitherto believed, whether the ſphincter will reunite and reſume its office, are queſtions which experience muſt decide.*"

This report is ſuch as we can read with unabated pleaſure, theſe expreſſions imply a zealous rational approbation, and the line of diſtinction is fairly, I would ſay irrevocably drawn, betwixt the old operation and the new! the whole manner of his harangue, before the preſident, does equal honour to his head and heart, to this unknown friendleſs man and to himſelf. Mery was as yet untainted with politics, he had, indeed, ſome lingering ſcruples about wounds of membranous parts; but theſe he ſeems ready to abandon, for though he was a pupil of the old ſchool, and hardly believed, he yet ſeemed willing to believe, that wounds of membranous parts are not mortal.

The honour and honeſty of Mery were ſoon and eaſily corrupted: If the principles of thoſe two operations were ſo eſſentially oppoſite to each other, and this new method ſo worthy of approbation, no errors of the operator, no want of ſkill on the part of a man confeſſedly ignorant of anatomy and the common principles of our profeſſion, no occaſional deviation of his knife, ſhould have perſuaded Mery to reverſe a deciſion ſo deliberately pronounced! for his approbation was founded not upon the dexterity or ſucceſs of the operator, but upon the mere principles of the operation. But Mery, hurried away by the torrent of profeſſional jealouſy, was found, even before one little week had paſt away, acting as the inſtrument of a malicious party, condemning impudently the operation he had juſt approved, publiſhing malignant criticiſms on the occaſional errors of the operator, and, in

boteuſe. De la vient que les parties qu'il diviſe, n'étant que coupées, peuvent plus facilement ſe réünir aprés ſon operation: d'où il ſuit qu'il doit y ariver moins de fiſtules qu'aprés l'operation ordinaire; parce que dans celle-cy les parties ſouffrant preſque toûjours une forte contuſion, il leur arrive une perte conſiderable de leur ſubſtance, par la ſupuration qui s'en fait; ce qui empêche leur réünion, et produit la fiſtule. Mais il me paroît, Monſeigneur, que Freres Jacques pouroit entrer, comme il fait, dans la veſſie, en faiſant ſon inciſion deux pouces plus haut que l'endroit qu'il coupe de'abord: ce qui rendroit la playe beaucoup moins profonde, et par conſequent ſa guériſon plus facile; ſupoſé qu'une playe du col et du corps de la veſſie ne ſoit pas mortelle le plus ordinairement, comme on l'a crû juſqu'icy, et que le ſphincter de la veſſie puiſſe ſe réünir auſſi exactement qu'il étoit. Pour cela il en faut venir à l'experience."

but a little while, we find him deputed to make a public harangue in the name of the profeſſed enemies of Frere Jaques.

Thoſe lithotomiſts of Paris, and the phyſicians and ſurgeons of the Hotel Dieu who had been upon the inqueſt, did not continue long indifferent to the impreſſions made by this firſt report; new and ſeverer trials of Frere Jaques' abilities as an operator, were immediately required; and diſſections proving the dangers of this operation, and harangues, proving the incapacity of the operator, followed the firſt generous avowals of his excellent talents.

"I received," ſays Mery, "on the 14th of the ſame month of December, a ſecond order from Monſieur the firſt preſident, to attend, at the Hotel Dieu, ſome farther trials of the operation of Frere Jaques. At this time he performed two experiments: he cut upon the body of a woman, and upon the body of a boy, from twelve to fourteen years of age. The boy he cut upon the ſtaff, dividing the accelerator, which he had ſpared in his firſt operations, and he ſo lacerated the beginning of the urethra, the neck of the bladder, and part of its body behind the pubis, that the bladder was almoſt entirely ſevered from the urethra."—"But theſe injuries," ſays Mery, "might perhaps be more juſtly aſcribed to the delicacy of the parts, than to the puſhing in of his finger, though it is none of the ſlendereſt."

"On the body of the female ſubject he cut, not upon the left ſide, as uſual, but upon the right ſide cloſe by the tuber iſchii, on the apex of the hip (moignon de la feſſe), having previouſly introduced into the bladder the ſame ſtaff he was wont to uſe in men. By his inciſion, (the lower end of which was oppoſite the anus, the middle oppoſite the perinæum, and the upper end oppoſite the orifice of the vagina,) he cut the vagina entirely acroſs, and opened the bladder from the place where the ureters enter, up to the beginning of the urethra."

Theſe were ſad miſtakes: but conſiſtency was not to be expected from Frere Jaques, neither were the incorrect and careleſs inciſions of a rude operator to be imputed to the method he uſed. How could one like Frere Jaques who knew nothing of the anatomy of the parts, be correct and uniform in his inciſions? he had, in cutting the boy, almoſt ſeparated the bladder from the urethra; in the body of the woman he had wounded the vagina; he had performed lithotomy on the female, with the ſame ſtaff, and had made the ſame inciſion in the perinæum, as in man, cutting upwards from the point of the hip: all this is true, and if, on thoſe grounds, Mery choſe to retract his firſt opinion; if he choſe to avail himſelf of the argumentum ad hominem, and ſay, I have proved him a bad operator, and his operation, of

courſe, cannot be good; if he choſe to impute theſe miſtakes of the operator, to the imperfection of his method, we cannot deny his privilege; but what becomes of his firſt eulogium of all that is eſſential to this method? of his decided preference of inciſion to laceration, in ſo far, at leaſt, as belonged to the extraction of the ſtone? how has he forgotten ſo ſuddenly the deſire he expreſſed, but a few days before, of "learning, by experience, whether wounds of the membranous part of the bladder were really mortal,"

Neglected in Paris, and deprived of the ſupport of the preſident Harley, by theſe machinations of profeſſional men, Frere Jaques repaired to Fontainbleau, where the court then was, and where the approbation and friendſhip of the court phyſicians, and the notice of the king himſelf, ſoon conſoled him for theſe diſappointments and enabled him, in a few months, to return to Paris in triumph. "He introduced himſelf, by letters, to Duſchene, firſt phyſician to the princes of the blood, who was delighted with his manner of operating, with his well atteſted cures, and eſpecially with his zeal, and the humane motives which had induced him to viſit the city. By Duſchene he was carried to Bourdelot, phyſician to the Ducheſs of Burgundy, to Fagon, firſt phyſician, and to Felix, body ſurgeon to Lewis XIV." While they were expreſſing the moſt earneſt deſire to ſee him perform his operation on a living body, "there fortunately preſented himſelf a ſhoe-maker's boy, of Verſailles, who lived, at that time, at Fontainbleau, cruelly afflicted with the ſtone. This boy, Duſchene, by order of the court, lodged in the houſe of a nurſe, and ordered him to be liberally ſupplied with every neceſſary: On this poor boy Frere Jaques performed his operation in preſence of Fagon, Duſchene, and Felix, and with ſuch addreſs, that they retired highly delighted with the operator, and Felix, in particular, was ſo charmed that he carried him home to his own houſe, and kept him there while the court remained at Fontainbleau."

"This operation was rumoured abroad: it muſt be acknowledged," ſays Dionis, "that this was a coup d'eſſai, moſt fortunate for Frere Jaques; the operation was rapidly performed; the boy paſſed his urine naturally ſoon after the operation; no ill ſymptom retarded the cure; and, in three weeks after the operation, he was ſeen walking in the ſtreets of the village."* Beſides this boy he cut ſix

* The biographers of Frere Jaques have all copied this narrative from Dionis, but the moſt unaccountable tradition is that propagated by the elegant tranſlator of Heiſter, who tells us, that "this boy was ſeen, in three weeks, walking about in the areas." If this be true, and it be alſo true that the boy, as was reported by many, laboured under a perpetual fiſtula, and incontinence of urine, he choſe his walks well, and would never

others at Fontainbleau, four in the hoſpital, and two in private: his addreſs and courage were loudly proclaimed by the phyſicians and ſurgeons of the royal family: the prince took a particular intereſt in the fate of the boy, the bulletin of whoſe health was daily preſented to the court, by Duſchenes; and when the lad was ſeen walking abroad again, the king was heard to ſay, "this is a man that muſt not be neglected;" orders were iſſued accordingly that Frere Jaques ſhould be lodged and maintained at his majeſty's expence.

The king now returned from Fontainbleau, to Verſailles, after an abſence of four months, and Frere Jaques approached the capital a ſecond time, ſtrong both in reputation and in friends, hated by none but the ſurgeons, ſupported by the authority of the court and the enthuſiaſm of the people, "all the world knew of what he had done at Fontainbleau, and thoſe afflicted with the ſtone were ſought after, and placed under the care of Frere Jaques as the greateſt charity and favour that could be done them."

His progreſs was rapid and enterpriſing, his ſucceſs may be eſtimated by the fury with which he was oppoſed; ten or twelve operations performed, in the city of Paris, with a degree of eclat, gave him new claims on his protector Harley, who required once more a deciſive report from the ſurgeons and phyſicians of the Hotel Dieu; this produced an extraordinary and agitating ſcene in the palace of the archbiſhop of Paris, where the great queſtion was finally and ſolemnly decided, whether Frere Jaques ſhould be received into the hoſpital to cut for the ſtone. To contemporary writers we muſt naturally appeal, not merely for facts and documents, but for their ſenſe of the machinations and profeſſional politics of the day; and we find every reaſon to believe that a plot was engendered among theſe reſtleſs men; the debate, in the archbiſhop's palace, was plainly a conteſt betwixt the friends and the enemies of Frere Jaques. "Among the mob of lithotomiſts in Paris," ſays Mr. Garengeot, "the utmoſt ſolicitude and conſternation prevailed, when they ſaw the operation of the apparatus major about to fall into utter neglect; themſelves about to become pupils to new maſters, and as pupils, not likely to be eſteemed

be out of his way. Of all the good books that have ever been mangled by ill tranſlating, Heiſter's has ſuffered moſt; for his tranſlator, though ignorant of every language, is yet ſo fond of tranſlation that he tranſlates even the names of places, and inſtead of Bois le Duc, he makes Verdun "convoy friar James to Dukes Park;" without knowing one technical term, or the name of one inſtrument in ſurgery, he has impudently tranſlated a whole ſyſtem; and, what is more unaccountable, without improving his knowledge, either of the profeſſion or of the language of his original; for the end of his tranſlation is as ignorant as the beginning of it.

nor employed, in an operation ſo new to them, they ſtrove to weaken the favourable impreſſions made by the firſt report of Mery, and Mery himſelf was carried with them down the ſtream *. Garengeot declares, "that it was the deſign and policy of Mery to extinguiſh, though of the utmoſt importance to ſociety, the diſcovery of a harmleſs unprotected man †. Shallow policy and ſhort-ſighted! for the talents and good fortune which require ſuch meaſures are not eaſily ſubdued! Seldom has ſuch experiment been tried without raiſing the object of jealouſy to an unmerited degree of honour.

On the 7th of April, in the year 1698, the magiſtrates of the city, the phyſicians, the ſurgeons, and the managers of the Hotel Dieu, were aſſembled, in the archbiſhop's palace, to try this cauſe; and Mery acknowledges, that it was at the requeſt of the lithotomiſts and ſurgeons, that he opened the debate. He affected to ſpeak with his wonted impartiality, but he was now the avowed head of a party: he reverſed his firſt favourable report, and retracted even his doubts, about the mortal nature of wounds in the membranous part of the bladder: he declared that he had a ſtrong perſuaſion (mais il eſt fort a craindre) that the ſphincter veſicæ once cut, will never reunite; that incontinence of urine muſt enſue; that Frere Jaques's operation, in which the knife paſſes from the hip to the bladder, by the ſide of the vagina, in woman, by the rectum in men, and cloſe to the hypogaſtric arteries in both ſexes, endangers all theſe important parts: "And the injuries of theſe parts," ſays Mery, "being ſo much more important than any that happen in the apparatus major, I leave you, gentlemen, to decide, whether this operation be not more dangerous than that in common uſe." This harangue, which began with ſome inſipid compliments, ended in the impeachment of an operation, the principles of which he had ſolemnly and deliberately approved; it was a harangue ſo violent as to lay open the deſigns of the party, and expoſe Mery to be accuſed of the moſt diſingenuous conduct. It is ſpoken of by Morand, in terms of indignation and contempt, as a ſad ſpecimen of the reſtleſs politics of that intriguing city. "We too

* "Mais une foule de lithotomiſtes, deja conſternés de voir la taille au grand appareil prèté à tomber dans l'oubli, ſe dirent qu'ils alloient devenir des ecoliers, qui pourroient bien n'etre pas les plus habiles dans cette nouvelle maniere, ni par conſequent les plus recherchés."

"Ainſi des lors on eſſaia d'affoiblir le ſuffrage de M. Mery en faveur de Frere Jaques. M. Mery lui même ſe laiſſa emporter au torrent."

† "Mais le parti etoit pris; et il falloit etouffer une decouverte nouvelle, quoique de la derniere importance, parce qu'elle etoit inventée par un homme ſans nom."

often," ſays Morand, "perceive, among men of ſcience, a ſpirit of perſecution and rancour which deadens all emulation, and from ſuch a ſpirit I have myſelf ſuffered much."

The detail of thoſe caſes I have tranſcribed on the margin *, and in Mery's comment upon them we may ſee plainly the proofs of that malice prepenſe of which he was accuſed; his pettifogging zeal had enabled him to collect together only a few idle and malicious tales, from this phyſician, and that ſurgeon! nameleſs, and treacherous men, who had been permitted by Frere Jaques to be preſent at his private operations. But with all his induſtry he was able to make out no worſe

* *Report of the Patients cut by Frere Jaques, in Paris and Verſailles.*

"After his arrival in Paris in the ſpring 1698, Frere Jaques procured many patients in private. Firſt, he went down to Verſailles, and there cut four people in La Charité, and two in private, among whom was a ſoldier of the Iriſh brigade, who having received a muſket-ſhot five years before in the bladder, the ball formed the nuclæus of the ſtone. Among theſe patients was a little girl of ſeven years of age, who died on the third day, and her body was diſſected by Felix, the king's ſurgeon, and by Dionis, whom he had invited to go along with him. "We found," ſays Dionis, "that the bladder was wounded in its body near the neck, and in the vagina we found a wound the ſize of a nail, which the knife had made in paſſing by the ſide of the vagina to reach the bladder; upon obſerving this, Frere Jaques ſaid that wounds of the vagina were of very little conſequence! that he often wounded the vagina."

"La Cour partant pour Verſailles, Frère Jaques prit le chemin de Paris où ſa reputation l'avoit devancé. Il y trouva tout le monde informé de ce qu'il avoit fait à Fontainbleau, et chacun s'empreſſa de lui procurer des ſujets, croyant leur faire plaiſir que de les mettre entre les mains du Frère. M. Felix m'envoya chercher pour aller avec lui en faire l'ouverture; nous trouvames la veſſie ouverte dans ſon corps proche ſon col; c'eſt-à-dire, en l'endroit où il a coutume de l'ouvrir; nous vimes au vagin une plaie de la longueur de l'ongle, elle avoit été faite par le tranchant du biſtouri en le pouſſant le long du vagin pour aller à la veſſie. *Frère Jaques dit à cela que les plaies du vagin n'étoient d'aucune conſequence et qu'il lui arrivoit ſouvent de le percer.*"

"In Paris, about the beginning of April, before the conclave held in the archbiſhop's palace, he had operated, in private, upon eight patients: firſt, upon Madame La Lorraine, in whom he cut the vagina through and through, as I could perceive by the profuſion of blood which iſſued through the orifice of the vagina." (Mery). "And upon trying his operation myſelf, the ſame day, by order of the lord preſident, on the dead bodies of a woman and a girl, I found that I had pierced the vagina in both. Next I ſaw Frere Jaques cut a boy, of ſixteen years of age, from whom he extracted five pretty large ſtones; he ſuffered at the time, conſiderable hæmorrhage, and even on the third day, the blood continued to iſſue by the wound, the penis, and the anus; which ſhows clearly that the inteſtine was wounded. This boy *died in September, fiſtulous*, but his body was not opened. Next I ſaw him cut two men and a boy; one died of hæmorrhagy, of the other I knew nothing. Of the boy I am aſſured, by Mr. Thomas, a ſurgeon, that he has a tumor in the groin, and paſſes his urine inſenſibly, although his wound is actually cured."—"I have heard of his cutting three more in Paris; of one of theſe, a little boy, *a phyſician* who was preſent aſſured me, that, having cut the boy by the gripe, he had introduced, alternately, his ſcoop and forceps, till the boy was quite exhauſted; that two days after he died of convulſions, and, upon opening the body, the bladder was found lacerated as if with an iron comb."

accuſation than this, that of eight patients cut by Frere Jaques, two were dead, (de huit taillés qu'il a deux ſont morts trois jours après) and this with his conjectures concerning the injury done to the vagina of Madame La Lorraine, and the wounded inteſtine of the boy (vid. report in 1ſt foot-note) was all he could allege againſt Frere Jaques! but as the lady was reported alive, and the boy was reckoned againſt Frere Jaques, among the dead, Mery ſhould have ſaid no more about the rectum of the one nor the vagina of the other.

Impartial writers tell a very different tale of his ſucceſs: "Meſſrs. Dupont and Sauré (my colleagues)," ſays Garengeot, "agree with many other ſurgeons, of unqueſtionable veracity, in ſaying that they have ſeen Frere Jaques operate, not only on the ſixty patients cut in the Hotel Dieu (after this debate), but on a great many privately in the city (viz. thoſe mentioned in this report of Mery), and they aſſure me that the ſteady and deliberate manner of his inciſion, and the eaſe with which he paſſes his forceps, and immediately extracts the ſtone, without any violence, charmed all who beheld him."—"It is no wonder," ſay theſe gentlemen, "that we have, among ſo many operations, ſeen ſeveral which were followed by very diſmal conſequences; but we declare that we have ſeen by far the great number of theſe patients recover with inconceivable rapidity, and without the ſlighteſt miſchance or interruption *." While the impartial, among his countrymen, defended him from thoſe imputations, ſtrangers were not inſenſible of the malice of his rivals, and came, at laſt, to receive the many ill things reported of him with great caution. "I am ſenſible," ſays Dr. Leiſter, in his letter from Paris, "that he has got abundance of enemies, which makes me very often queſtion what I may hear ſaid of him."

At the concluſion of Mery's oration, the phyſicians, the patrons, and defenders of Frere Jaques, came forward; they acknowledged the facts detailed by Mery; they alſo acknowledge that this method of inciſion in the neck of the bladder, which had been uſed in former times, had probably been abandoned from a ſenſe of

* "De plus, Meſſieurs *Dupons et Sauré* mes confrères, et pluſieurs autres chirurgiens dignes de foi, m'ont aſſuré avoir vû tailler par *Frère Jaques*, non ſeulement une grande partie des ſoixante ſujets qu'on vient de citer, mais encore un aſſez grand nombre de perſonnes dans Paris; et m'ont certifié *que la façon delibérée avec laquelle cet opérateur travailloit, et la facilité avec laquelle il pouſſoit ſes tenettes dans la veſſie, et en retiroit promptement les pierres, ſans faire aucun effort, charmoit tous les aſſiſtans.* Il eſt vrai, m'ont ils dit auſſi, qu'ils ont été temoins de pluſieurs taillés qui ont été ſuivies d'accidens très funeſtes, mais auſſi qu'ils en ont vû guérir une bonne partie avec une promtitude inconcevable, et ſans avoir eu le moindre accident."

its dangers. But they reminded the aſſembly, that his ſucceſſes in the provinces were well atteſted, while his miſcarriages in the city were not ſuch as juſtly to exclude him from farther trials; they declared it, as their opinion, that farther experiments ſhould be allowed, and, in the end, ſo different was the ſenſe of this aſſembly concerning his ſucceſs, from that which Mery wiſhed to impreſs upon them, that it was agreed before the meeting roſe, that Frere Jaques ſhould, during the enſuing ſeaſon, be permitted to perform the operations of La Charité and the Hotel Dieu.

Spring was come, the ſeaſon for cutting for the ſtone in France; and Frere Jaques now exhibited, on the public ſtage, with a degree of ſteadineſs, courage, and ſkill, which delighted all impartial ſpectators: but, for this temporary triumph of our operator, the ſurgeons and lithotomiſts of Paris took a deep and laſting revenge. In the month of April he began his operations, and in a few weeks had cut ſixty people of various ages for the ſtone. "He laid his patient upon the operation table, and, placing a pillow under his head, gave him to the aſſiſtants to hold, with the thighs elevated, and the heels bent towards the buttocks. He never tied his patients, as they did, in performing the more lingering operation of the apparatus major." "He made uſe," ſays Buſſire, "of a ſteel ſtaff much bigger and ſhorter than that in common uſe; it was ſhorter from the handle to the heel, where it bends more than ours, and he had but two, one for women and one for men." He introduced this ſtaff, (big, round, and having no groove,) into the bladder, and, holding it with the left hand, he preſſed it ſo againſt the perinæum, as to make that part of the bladder project, which he meant to ſtrike with the knife. Then taking in his right hand a long knife, dagger-ſhaped, he plunged it into the left hip, at the diſtance of two inches from the perinæum, and, puſhing it directly onwards, opened the body of the bladder as near as poſſible to its neck, never once withdrawing the biſtoury, till he had made an opening proportioned to the ſize of the ſtone *. He then introduced his finger to feel for the ſtone, and, running in a conductor along the finger, he introduced the forceps upon it; and, having ſeized the ſtone, pulled it coarſely out, indifferent to the effects of that violence with which it was extracted."—"Having extracted," ſays Dionis, "whatever ſtones remained

* "Puis prénant de ſa main droite un biſtouri long *fait en forme de poignard, il le plonge proche la pointe de la feſſe gauche* deux doigts loin du perinée, et *le pouſſant droit vers la région de la veſſie* il l'ouvre dans *ſon corps* le plus près de ſon col qu' il peut; il ne retire point le biſtouri qu'il ne l'ait ouverte autant que le demande la groſſeur de la pierre."

within the bladder; he cares nothing for the patient, applies neither defenſive nor aſtringent, contents himſelf with a little wine and oil for a dreſſing, and when he has been remonſtrated with concerning the neceſſary and decent care of his patient, this has been his anſwer: "I have extracted the ſtone, God will cure him."

Such was the nature of his operation, and as for the manner in which he performed it, it is ſpoken of with the higheſt applauſe. What muſt have been the feelings of admiration and thankfulneſs, when, in place of tying the patient, as for the apparatus major, in a manner more cruel by far than that now in uſe, the patient was ſimply held down upon the table? when, in place of the difficulties and delays of the apparatus major, the labouring with the dilators, the cries of the patient, and the doubts which the ſpectators endured, often for an hour, whether the ſtone could at laſt be extracted! this ignorant but dauntleſs operator, ſtruck his dagger-like knife into the hip, far from the uſual place of inciſion! moved it upwards and downwards to enlarge the wound, paſſed firſt his finger into the bladder, and then the forceps, and in a few moments extracted the ſtone, though as big as an egg? The doors of the hoſpital where he operated, were beſieged at an early hour, and ſuch was the preſs of ſpectators, that centries were required to keep back the mob; no phyſician nor ſurgeon of the city was abſent from his operations, and ſtrangers reſorted to Paris from all quarters, to ſee him operate. They were awe-ſtruck when they beheld him drive his knife deep into the hip, and keep it there, ſearching with the point of it for the ſtone, and enlarging the wound according to its ſize."—"There was no one who did not tremble at the dreadful manner of his inciſion, and ſurgeons, inured to operations, were altogether confounded and affected with horror, when they ſaw him keep his knife ſo long within the parts *."

I have compared and tranſlated Dionis and other authors faithfully, and cannot be deceived, in regard to the form of his poniard-ſhaped knife, or the mannner in which he ſtruck it into the hip. Leiſter, who then lived in Paris and took a particular intereſt in this operation, ſays of this operator, "He cut both by the ſmall and the great apparatus, and in both *he boldly thruſts a broad lancet or ſtilletto into the middle of the muſcles of the thigh near the anus, and plunges it till he meets the ſtaff or the ſtone.*"—"I ſaw him," ſays Leiſter, "perform the operation upon nine perſons in three quarters of an hour, very dextrouſly: he ſeemed to venture at all; and put me in ſome diſorder, and a ſtouter Engliſhman than myſelf, with

* "Il n'y avoit perſonne qui ne tremblat en le regardant opérer, et les chirurgiens mêmes quoiqu' aguéris ſur ces ſortes d'opérations étoient effrayez de lui voir tenir ſon couteau ſi long-tems dans la plaie."

the cruelty of his operation. However, I viſited them all in their beds and found them more amazed than in pain *."

Even his enemies durſt not deny that he was endowed at once with uncommon courage and preſence of mind, joined to the moſt amiable diſpoſitions. "Reports," ſays Mery, "which have come to us from various quarters, incline us to doubt the ſtory he relates of his own life; yet all the world allows him to be a man of unſubduable boldneſs; he never, in time of operation, was ſeen to faulter, or ſeem diſmayed: he has a firm and ſteady hand; never perhaps has there been ſeen a more daring operator: he is withal pious and charitable, and it were greatly to be wiſhed that ſuch a man were better inſtructed in the anatomy of the parts."

"Frere Jaques cut alſo in the ſame way in the other hoſpital, La Charité, much about the ſame time, eleven at twice. Mr. Marechal, the beſt of the ſurgeons for this operation in Paris, harangued againſt him before the governors, who coldly replied that they would be determined by the event, which was beſt."

The event was moſt diſtreſſing to his friends and favourers; his patients began to die in the hoſpital of La Charité, and Mery was employed once more in the welcome taſk of diſſecting the patients and ruining the reputation of the lithotomiſt, till he at laſt drove him out of the capital to wander over the provinces of France. Of the patients cut by Frere Jaques in La Charité, nineteen in number, eleven only ſurvived; nearly half his patients (ſeven of them) were in one day carried to the Salle des Morts †. Yet the fate of theſe patients, far from injuring the reputation of Frere Jaques, raiſed the popular enthuſiaſm to its utmoſt fervour! it was univerſally believed, that the religious who officiated in the hoſpital, mangled, in the courſe of their dreſſings, the wounds which Frere Jaques had made correctly, and actually poiſoned his patients, ſo that they died.

There are inauſpicious moments in the life of every individual, which, if he perform in public a part important to ſociety, become remarkable. The fortune of Frere Jaques was now at its criſis; ſtung with chagrin, he moſt unwiſely accuſed the monks, a vindictive ſet of men, and of powerful influence, or if he did not directly accuſe them, he was acceſſary to the report propagated by his friends, for a ſingular ſcene took place in the hoſpital of La Charité, which ſhows his imprudence. The reverend father prior of the hoſpital, when the patients of Frere Jaques

* Leiſter's Journey to Paris, p. 237.

† Il mourat à La Charité juſqu' à ſept en un même jour.

began to die ſo many in a day, ſent for Mery and Marechal to diſſect the bodies; he had the diſcretion and prudence to ſend at the ſame time for Frere Jaques, and while the anatomiſts were employed in the diſſection, the prior, turning to the friar, told him, "that it was altogether unbecoming a man of integrity or principle, to accuſe, as certainly he had done in the city, the prieſts and ſurgeons of La Charité of deſtroying the patients, by thruſting inſtruments into the bladder after this operation."

Is it to be believed that men profeſſing religion and charity, and voluntarily devoted to the care of the ſick, could be guilty of ſo unnatural a crime! of taking away the lives of fellow creatures merely to diſgrace his operation. Frere Jaques was maddened with jealouſy, and willing to allege any thing but the natural cauſes as the occaſion of his patients dying; and it was a ſure proof of declining reputation that he was reduced to an artifice ſo low as this. His patients began alſo to die in the Hotel Dieu, where there were no ſurgeons unfavourable to his cauſe, no prieſts to poiſon or deſtroy, no time indeed to meditate or commit ſuch cruelties, for very generally his patients died before the firſt dreſſing, on the third or fourth day. The report of Mery is, on this occaſion, but too true, that of the ſixty-two patients cut in both hoſpitals, twenty-five died. The proportion of deaths was ſmall indeed, compared with the mortality of the Hotel Dieu in former times; but it was ſo unexpected as to aſtoniſh the vulgar, who looked for miracles, who believed him a man peculiarly endowed by heaven with the talent of performing operations, perhaps they believed that none ſhould die. Collateral authorities agree nearly in the numbers that died: Mr. Probie an Engliſh gentleman, then in Paris, writes thus to his friend: "Frère Jaques's reputation mightily ſlackens, for of forty-five cut in the Hotel Dieu, but ſixteen ſurvive; and of nineteen cut in La Charité, only eleven ſurvive: but I am ſenſible that he has got abundance of enemies, which makes me very often queſtion what I hear; the ſurgeons have a great mind to cry down this man while they practiſe his method."

Frere Jaques wearied and diſpirited by unremitting perſecution, and affected by the death of ſo many of his patients, left Paris to travel over the provinces: by letters from Mr. Noel, we find him, in July in this year (1698) at Orleans; at Aix la Chapelle in Auguſt; and ſoon after we find him announced in the Dutch newſpapers, as Lithotomiſt to his moſt chriſtian majeſty, a title which he ventured to aſſume on the ſtrength of his certificates from the phyſicians of the court:

in the year 1699 we find him introduced in Holland, to M. De Bonrepos, then ambaſſador from France.

Whatever the buſy talents of Mery had diſcovered or invented concerning the dangers of this operation made but a ſlight impreſſion on the public mind. Marechal in Paris, Rau in Holland, and Cheſſelden in England, practiſed this operation, oppoſite as it was in its principles to that by the apparatus major which they had hitherto performed. In Holland and Germany Frere Jaques was received with the ſame enthuſiaſm as at firſt in Paris, and every where his dexterity and preſence of mind were applauded. When he ſet out from Zutphen for Amſterdam, a nobleman whom he had cured appriſed Verdun of his arrival, and requeſted that he might be reſpectfully received. "And accordingly, Guerell, chief phyſician to the hoſpital at Amſterdam, with ſeveral other perſons of merit and diſtinction, had a meeting in the houſe of the brother of this nobleman, after the arrival of Frere Jaques: they converſed with him and viewed his inſtruments; his catheter, we are told, was then without a groove, and his firſt operation in that city was performed upon a lad who was a waiter at a capital inn: at this operation were aſſembled, by order of the ſenate, the chief phyſicians of the hoſpital and city, and along with them Berengarius; and Frere Jaques performed his operation before them with ſo much ſlight and dexterity, and in ſo ſhort a time, that it raiſed an admiration in all that were preſent, and made them praiſe and extol our operator even before the ſenate *."

The excellency of Frere Jaques's operation had made a deep impreſſion on the mind of Mr. Fagon, who never ceaſed to think of him, and, being himſelf afflicted with the ſtone, reſolved ſooner or later to put himſelf into his hands; for though Marechal and all the beſt ſurgeons in France and Holland performed this new operation, and, by their acquaintance with anatomy, performed it with ſufficient ſkill; yet Fagon could not forget the bold and deciſive manner in which it was performed by Frere Jaques himſelf. He was the firſt who received Frere Jaques kindly at Verſailles: he had diſmiſſed him, even after his misfortunes in Paris, with flattering teſtimonies of his approbation: he marked his progreſs through Germany and Holland: and, in the year 1700, he recalled him to Verſailles, invited him to lodge in his own houſe, and perſuaded him to go through a complete courſe of ſtudies and diſſection.

* Heiſter.

This forms a new and intereſting epoch in the life of this extraordinary man, who, after being long an operator, ſubmitted to the diſcipline of the ſchools, and, by ſtudying under the greateſt maſters, added to his natural talents and addreſs a knowledge of the parts.

Many a fool, affecting indifference to the natural fear of death, has blazoned his folly by building himſelf a tomb or placing his coffin in his bed-chamber: but Fagon, from manly and ſenſible motives, did what denotes to me greater firmneſs of purpoſe! He accompanied Frere Jaques through a ſuit of diſſections with a continual reference to the operation which he was himſelf to ſuffer, and witneſſed, in living ſubjects, in the hoſpital of Verſailles, experiments in that operation, the caſualties of which might deprive himſelf of life. Frere Jaques was made firſt to operate on dead bodies, the parts being diſſected by Du Verney, and then the peculiar dangers of his operation, ſo plainly ſuperior to every other, were impartially diſcuſſed: Every thing dangerous was next corrected, and the neceſſary improvements explained to Frere Jaques, who received at once the leſſons of Du Verney, the moſt celebrated anatomiſt, of Felix, the king's body ſurgeon, and of Fagon, his future patient and his friend. It was finally reſolved that he ſhould operate, in future, with a grooved ſtaff, and with this corrected inſtrument he renewed his experiments, which were ſoon declared by Du Verney to be complete. With this improved ſtaff and corrected operation, he cut thirty-eight patients in Verſailles, as is proved by the certificates of Bourdelot, Boudin, and Gervais, ſurgeons in ordinary, without loſing one. This was the ſecret of all his after-ſucceſſes; for, when Frere Jaques paſſed again into Holland and Germany, he cut with aſtoniſhing ſucceſs; no ill reports followed him as in his firſt career. "Ferhius, a Swiſs phyſician," (who publiſhed a theſis, anno 1716,) ſays, "that of ſixteen lately cut by Frere Jaques, in Straſburgh, one only died, and that an old man, whoſe death was predicted from his age and weakneſs." Frere Jaques while operating in that city, whiſpered Salzmanus in the ear, "that he had left off his rude way of operating, and now uſed a grooved ſtaff." Weiſbachius teſtifies that he had ſeen Frere Jaques cut twenty for the ſtone, in Straſburgh, of which hardly one miſcarried, but were all cured preſently without fiſtula or any other diſtreſs.

Never were any leſſons of men of ſcience more ſucceſsful than theſe of Fagon and Du Verney, nor received with more modeſty and thankfulneſs by any artiſt. He would teach well, and diligently! who was to reap, ſo immediately, the fruit of his own labours. Frere Jaques, in a little memoir which he wrote in defence of

his reputation, mentions his gratitude to Fagon in the following terms: * "Frere Jaques had obſerved that the dangers and injuries connected with this operation, proceed chiefly from the wounding of the root of the penis, where its cavernous bodies join, and that to avoid theſe dangers the inciſion ſhould be made in the neck of the bladder; and having of late introduced himſelf to Meſſrs. Fagon and Felix, the king's phyſician and ſurgeon, and performed many operations before them, upon both dead and living bodies, they were perſuaded that the operation was in itſelf good, ſuperior to the old operation, and requiring chiefly to be improved in reſpect of the inſtruments; and they thought that a good grooved catheter ſhould be uſed to inſure the place of the wound. Frere Jaques has reformed all this, has continued to practiſe this improved operation on the living as well as on the dead body, for four years, and has not neglected to obſerve other points in which his operation might be improved both in reſpect of the inſtruments and of the inciſion. Having been often examined by Meſſrs. Fagon and Felix, and the other ſurgeons of the court; having performed many experiments in their preſence, both on the dead body and on the living, theſe gentlemen, regarding his operation as very valuable to the public, have been pleaſed to grant their approbation which has been ſeconded zealouſly by the mayors, ſheriffs, and governors, of the various cities and provinces of France." The ſurgeons of the court had, indeed, behaved in the moſt liberal manner: they procured him paſſports from the court: they gave him the moſt unqualified certificates of his ſuperior ſkill and courage: they bore witneſs to his charitable and diſintereſted conduct, and to the perfect ſucceſs of every operation performed in their preſence: they aſcribed his ſucceſs to the improvements in his operation, to his ſkill lately acquired in anatomy, and to his uſing a grooved ſtaff, from the groove of which he never moved his knife till the inciſion in the neck of the bladder was complete. Nor was it from the court phyſicians only that he obtained thoſe teſtimonials of his ſucceſs; but from all the ſurgeons of Verſailles; they gave it under their hands "that he had cut thirty-eight patients in the hoſpital with uniform good fortune." How different this from the invidious conduct of Mery, of whom Frere Jaques complains, but ſtill with modeſty and candour. "Of hundreds of healthy ſubjects cut after this improved method," ſays Frere Jaques, "none had died or remained fiſtulous, though Meſſrs. Mery and Saviard, maſter ſurgeons, have ſo affirmed in their writings,

* The Memoir was anonymous; Frere Jaques therefore writes in the third perſon.

and have circulated thoſe writings with ſuch diligence, in all the provinces, as to impreſs the people with the moſt unfavourable opinion of him, which is indeed his chief reaſon for writing theſe few papers to undeceive the world."— "Why," ſays Frere Jaques, "ſhould Mr. Mery declare this method good in itſelf and requiring no other reform than that of cutting upon a grooved ſtaff, without waiting the iſſue of that improvement which he had himſelf adviſed? without expecting impartially the reſult of future experiments? But indeed Mr. Mery takes a pleaſure, not in aſſiſting but in blaming the operator, and in accuſing him of cutting the ſpermatic veſſels in thoſe he pretends to cure of the rupture, and he takes particular delight in likening him to one Raoult, whom he calls a mountebank and rogue. But in truth Frere Jaques, during thirty years that he has practiſed this operation, though he has operated on four thouſand five hundred patients afflicted with the ſtone, has beguiled no one, nor ever operated but in preſence of phyſicians and ſurgeons and by their conſent and advice *."

There were, at this moment, two men of eminent rank who had reſolved to ſubmit to the operation of Frere Jaques, the one Mr. Fagon, firſt phyſician to Lewis XIV. the other the Mareſchal de Lorges: both had taken meaſures to enſure the ſucceſs of the operation, but, in the very moment that Frere Jaques was about to attain the moſt diſtinguiſhed honour, he ſuffered a ſad reverſe of fortune. Mr. Fagon had himſelf taught Frere Jaques, and with the aſſiſtance of Du Verney, the celebrated anatomiſt, and Felix, firſt ſurgeon to the king, had made him go through a ſeries of diſſections: His operation was reformed according to their deſire, he had forſaken his big round ſtaff, and cut upon a grooved one; he had operated on thirty patients in the Hotel Dieu, of Verſailles, with uninterrupted ſucceſs: he had already ſounded Fagon, and felt the ſtone, yet Fagon, though thus far advanced in this generous deſign, was prevailed on, by the ſolicitation of his friends, to put himſelf into the hands of Marechal, who had learnt to perform Frere Jaques's operation. Marechal accordingly performed the operation, and Fagon ſurvived, and in a few weeks went abroad in his carriage.

The Mareſchal de Lorges, of diſtinguiſhed rank and great fortune, proceeded with equal precaution; he aſſembled in his hotel twenty-two poor people afflicted

* Vide Frere Jaques's Memoir in defence of himſelf, in compoſing which he probably had the aſſiſtance of Hanault and the advice of Fagon, Felix, and his other friends; for Hanault took a particular affection for Frere Jaques, conſulted with him about the means of improving the operation, and promiſed to defend him from the inſolences of Mery.

with the ſtone, who were cut by Frere Jaques with perfect ſucceſs; but while the poor patients ſurvived, the Mareſchal himſelf died in tortures the day following the operation. This was deciſive of the fate of our operator; the Mareſchal de Lorges lying dead in his ſuperb hotel, while Fagon, cut by M. Marechal, was rolling in his chariot in the ſtreets of Paris, was a triumph for the regular lithotomiſts and a mortal blow to the reputation of Frere Jaques, who now departed from Paris never to return.

Whatever judgment we may be inclined to form of this extraordinary man, we owe to his memory this ſimple reſpect, viz. of tracing his future courſe, till his arrival in his native village, where he reſolved to end, in poverty and obſcurity, a life ſpent in deeds of charity.

After leaving Paris he continued to travel for many years, over the provinces of France, Holland, Switzerland, Germany, and Italy; there was no country, except our own, in which he had not appeared. He was firſt invited by the ſenate of Geneva, to viſit their republic, he cut five patients in the city and two in the adjacent villages, and received the public thanks of both the greater and leſſer council. In the year 1704 he was earneſtly ſolicited to viſit the city of Amſterdam, where he arrived in the month of July, and by permiſſion of the magiſtrates cut numbers in the hoſpitals of that city. He ſtill preſerved the character and outward ſigns of ſanctity, charity, and ſimplicity of life: he was followed by the people with enthuſiaſm, and regarded even by thoſe of better education, as one ſent from heaven. But "Rau publiſhed journals of the ſucceſs which the operation had upon thoſe who were cut by the French Lithotomiſt; which proceedings being laid open, demoliſhed his reputation, ſo as to make him leave the place, in which office Rau was happily employed with very great applauſe, and retained till his death *." Thus were the politics of Paris received in Amſterdam, but when the place of city-lithotomiſt was beſtowed on Rau, ſuch tumults aroſe in the city that the magiſtrates were obliged to expreſs, in a public manner, the gratitude of the people by conferring an honorary reward on Frere Jaques †. At Delft, Utrecht, Leyden, and the Hague, he had equal ſucceſs; and on his viſiting the latter city, the

* Heiſter.

† They had his portrait engraved, the prieſt in his religious habit; in the diſtance was a hermitage; above it was written, "Ægri quia non omnes convaleſcunt, non idcirco nulla medicina eſt;" and below was written, "Frater Jacobus de Beaulieu, Anchoratta Burgundus Lithotomus, omnium peritissimus."

magiſtrates had his portrait engraved anew, and preſented him with a ſet of golden ſounds.

Rau, whoſe rare talents and incomparable meanneſs of diſpoſition kept an almoſt equal pace, ſo that we know not whether moſt to admire or deteſt the man, publiſhed, like Mery, his daily ſcandals, and diſſected Frere Jaques out of the capital of Holland! and yet he ſtole the very operation which he affected to condemn. But it was neither the treachery of Rau nor the unfavourable deciſion of the magiſtrates of Amſterdam that drove Frere Jaques out of the city, it was his own reſtleſs deſire to travel. Having traverſed Holland, he went to Angers, then to Bruſſels, and in that city received, as the laſt teſtimony of the gratitude of Amſterdam, a letter from the ſenate expreſſing their reſpect, and a medal bearing the arms of the city, a crown encircled with a wreath of oak, and the inſcription, "*Ob cives ſervatos.*" He was even intreated by his private friends to return, and the modeſty and humility of his reply deſerves to be recorded. "Why ſhould I return to your city when you have already a man ſo much above me, as Rau?"

In the year 1707 he appeared again in France; and, in his way to Lyons and the ſouthern provinces, ſtopped at Verſailles to viſit Fagon, who received him with much kindneſs, and would have loaded him with preſents, which he refuſed with great conſtancy, accepting only new certificates of his approbation and friendſhip, and paſſports from the court, for travelling in the ſouthern provinces. He arrived at Lyons in the ſpring 1709, from thence he was called again to Geneva; from Geneva he was called to Nancy, by the Duke of Lorrain, to cut one of his principal officers for the ſtone: and was prevailed on by the prince to remain in his ſtates all that ſpring, and ſummer: During this ſeaſon he cut eight patients ſucceſsfully. He was next called to Liege, and there paſſed the winter of 1711. In the year 1712 he went to Straſbourg, and there it was that he whiſpered Salzmanus that he had reformed his operation and uſed a grooved ſtaff; in Straſbourg he cut ſixteen perſons for the ſtone, loſing only one diſeaſed old man. Such was at this time the reputation of Frere Jaques, that while the invidious group of lithotomiſts in Paris believed him loſt and neglected in ſome of the remote provinces, he was actually at the Court of Vienna, at the requeſt of the Emperor Charles Joſeph, whom he viſited for ſeveral days along with his ſurgeons and phyſicians, but the Emperor's diſeaſe was not of the nature that was ſuſpected when Frere Jaques was ſent for, and he was accordingly diſmiſſed with honourable preſents. In April 1713 he departed

for Venice, from thence he went to Padua, where he cut ſucceſsfully, and thence he went to Rome to receive the benediction of His Holineſs.

Wearied at length of travelling * and deſirous of viſiting his own country before he died, he left Rome and never ſtopped till he arrived in his native village, where, of all his relations, he found only ſome of his nephews alive. Having diſtributed among thoſe poor relations the little money that remained to him, he retired to Beſançon, where he lived long, and died much advanced in years: he was buried in his native village, in the church of St. John, from the regiſter of which Morand extracted the memorial of his interment. The medal preſented by the city of Amſterdam was never found! The golden ſounds he was known to have melted down before he died.

On reviewing what I have written of the life of this remarkable man, I feel loath to record ſuch uncharitable perſecutions, of one who ſpent his whole life in deeds of charity, who while he had it in his power to become rich, died in poverty, perhaps in want. Let us judge now according to his deeds: a man who, while alive, "was extravagantly extolled by friends and traduced by adverſaries," and was, as Heiſter ſays, "the ſubject of every one's thoughts and diſcourſe," of whom this at laſt muſt be acknowledged that through the various ſtages of a long and uſeful life, he proved himſelf a perſon of unfeigned ſimplicity and goodneſs.

He chanced to appear in a country full of empyrics of the loweſt claſs, and in an age when a jealous profeſſion was ſtriving to regain its privileges: he appeared as a mendicant friar profeſſing ſanctity, living on charity, and pretending a peculiar call from heaven to cut for the ſtone: his certificates gathered up in haſte, ſerved only the needy purpoſes of quackery! for he was chiefly concerned about the ſpeedy extraction of the ſtone, leaving the cure of his patient to heaven. His advertiſements were ſtuck up, on the gates of cities, and in courſing from province to province he contrived to outrun the rumours of his ill ſucceſs.

This man was, by a happy ignorance, puſhed on to make theſe inciſions in the body of the bladder, which phyſicians believed to be mortal; it was through the favour of the court, and the fanaticiſm of the people, that he was enabled to oppoſe a whole profeſſion, and permitted to operate in the hoſpitals of Paris, Verſailles,

* How many years he continued to travel is not abſolutely known, for while Morand cloſes his career in the June 1714, Heiſter aſſures us on the authority of private letters from the ſurgeon Verdun, that he had ſeen him perform his operation at Straſbourg in the year 1715; and we are told by Le Maire, his countryman, that he died at Beſançon, ſeventy years of age.

Straſbourgh, and Amſterdam: But the enthuſiaſm created by his new and daring manner of operating, ſoon expired; his patients died apace; his operation was critically examined by men ſkilful in anatomy, and it was not thought adviſable that a man ſo ignorant, ſo adventurous, performing his inciſions in ſo unguarded a manner, ſhould be preferred to the regular lithotomiſts of France and Holland.

At firſt he was nothing but a bold and fearleſs operator, his courage being excited by enthuſiaſm, and nothing qualified by any knowledge of the parts or foreſight of danger! He cut with all the audacious ignorance of a quack, ſometimes high, ſometimes low, ſometimes in the body of the bladder, ſometimes in the neck, ſometimes upon the gripe, ſometimes upon the ſtaff! and in women he made his inciſions in the perinæum exactly as in men: often he transfixed the bladder with his dagger-ſhaped knife, or, miſſing the bladder, ſtruck his knife repeatedly into the hip, mangling the parts with tranſverſe inciſions.

Yet there was in his peculiar manner of operating, that which reconciled men of ſcience to his rudeneſs, and in his actual operations there was ſo much boldneſs, ſelf-poſſeſſion, and peculiar addreſs, as made them think it a charity towards mankind to inſtruct him in the difficulties and dangers of his own operation! "Never," ſay contemporary authors, "has there been ſeen a more dextrous operator; the ſpectators tremble at the manner of his operation, when he ſtrikes his knife into the hip, and remain in breathleſs expectation, while he holds it there and ſearches with it for the ſtone, which he extracts to the amazement of all beholders." "He was a man," as the king had ſaid, "not to be neglected, nor was his operation to be loſt."

But Frere Jaques, after having received the inſtructions of Du Verney and Felix, and having lived in the houſe of Fagon; when he had reformed every ſtep of his operation and accuſtomed himſelf to cut upon a grooved ſtaff, performed an operation inferior to none practiſed ſince his time! He now was as ſkilful as he had at firſt been bold and fearleſs, and he had this peculiar happineſs, that he was the very operator that France, or rather all Europe required, and his courſe of life was ſuch as enabled him to do infinite ſervices to his fellow creatures. The ſtone, from low living and uncleanlineſs, was, over all Europe, but moſt eſpecially in France, a very frequent diſeaſe; his motives for devoting himſelf to this operation were very ſtrong, and they are expreſſed in his memoir, in a ſimple and ingenuous manner. "The mayors, ſheriffs, governors of provinces, have witneſſed that dexterity and ſteadineſs

with which nature and long experience hath endowed him; and they have alſo witneſſed the zeal, piety, and charity with which he hath conducted himſelf, receiving preſents from the rich only to give to the poor. But knowing, or fearing, that this would in the end be unto him an occaſion of ſin, he hath renounced all worldly goods by his vow, and given himſelf up to the ſervice of thoſe who are afflicted with the ſtone; the rich, when they ſend for him to diſtant provinces, bear the expences of his journey, and the charity they themſelves perform according to their hearts. Having obſerved the numbers afflicted with the ſtone in the various provinces of the kingdom, many of whom die from being unable either to ſend for one dextrous in ſuch operations or to have themſelves conveyed to any great city, ſuch as Paris, to be cut there; having remarked alſo that the ſurgeons in the country parts have uſually declined this operation, as difficult and full of danger; and it being for the public good that there ſhould be able lithotomiſts in the provinces, Frere Jaques has forſaken his family, abandoned all other operations, and applied himſelf ſolely and with much diligence to this operation."

"It appears ſufficiently," ſays Douglaſs, "from many particulars of his hiſtory, that Frere Jaques muſt have been a moſt profligate abandoned wretch." Never, I believe, was there a human creature leſs deſerving theſe epithets *. We are, on the contrary, pleaſed to find reſting on the mind, a reſpectful opinion of a man born in the loweſt ſituation in life, but with good talents and worthy ſentiments, and to whom our profeſſion owes the diſcovery of that operation which we now perform. From his time the ineffectual cruelties of the apparatus major were abandoned, and his operation univerſally received; even thoſe of the old faith who affected to perform the great operation, had their ſly coup-de-maître, which they durſt not avow; Rau, the celebrated Rau, learned his operation from Frere Jaques, and continued, during all his life, to conceal a diſcovery in which he had no right nor property, which he had learnt from an itinerant operator whom he affected to deſpiſe and conſpired to ruin.

* The man who wrote ſuch language muſt have had an unfeeling heart, but he who proved a crime by the following jeſuitical conſtruction of the ſecret ſentiments of one long dead, muſt have had a depraved one. "He muſt," ſays Douglaſs, "have been a moſt profligate abandoned wretch, and that, under an *outward* air of ſimplicity and ſel-fdenial, he concealed ſome *ſecret deſign or other*, which *perhaps* the multitude of perſons that died under his hands, prevented his ever putting it in execution." *Douglaſs*, page 28. If a man is guilty or ſuſpected of no crimes but thoſe which he never puts in execution, he might reaſonably enough expect to eſcape calumny.

ANATOMY OF THE OPERATION OF FRERE JAQUES.

Whatever in this operation is either creditable to the inventor or uſeful to poſterity, whatever circumſtances in his general method, or in his individual attempts, may ſerve as leſſons to the modern lithotomiſt, will be beſt underſtood by comparing his inciſions with the anatomy of the parts. He performed a daring inciſion by no rule: he operated with a round ſtaff or with a tubulated catheter: he operated, as Heiſter informs us, often with a pointed table-knife. "I myſelf," ſays Heiſter, "have heard the Dutch people ſay, while I was in Holland, that when our lithotomiſt came hither from France, he at firſt cut a number for the ſtone, and would ſometimes uſe a common blunt knife, to perform the operation, when his own inciſion knife was not at hand *." The manner in which he performed his inciſion was, by plunging this dagger-ſhaped knife into the point of the hip (la moignon de la feſſe): † The intereſt excited by his manner of operating, amounted actually to enthuſiaſm: In place of the tedious and ineffectual dilatations of the apparatus major, this fearleſs man was ſeen to plunge his dagger into the bladder at once, and almoſt inſtantly extract the ſtone. The eſſential of his operation was, that it ſubſtituted inciſion to dilatation, and gave the lie to the renowned aphoriſm which proteſts that "wounds of membranous parts are mortal."

My reader is, I believe, prepared to attribute every thing good and uſeful to the method itſelf! every thing irregular, dangerous, and diſaſtrous to the faults of the operator. He is alſo prepared to diſtinguiſh the rude inciſions performed at firſt by this bold but ignorant man, from the maſterly operation taught him by Du Verney and Fagon; for the operation which he was then taught forms a period in his life hitherto unnoticed, and an æra in our ſcience:—FIRST, Frere Jaques either remarked himſelf, or was taught by others to obſerve, the chief errors of the ap-

* And in another place he ſays, "He uſed a common knife like that which we uſe to our victuals." The table-knife of France and Holland was a long ſharp-pointed claſp-knife.

† "Il tenoit dans cette inciſion, une autre route que Frere Jacques; car cet hermite pouſſoit, en aveugle, un poignard obliquement de la partie interne de la tubéroſité de l'iſchion, juſques dans la veſſie; et quand cet inſtrument meurtrier n'enfiloit pas la vraïe route, il en arrivoit les déſordres que nous avons détaillés." Garengeot, page 192.

Anatomy of Frere Jacque's operation. *Page 115.*

Fig. 1st

Fig 2nd

Fig 3d

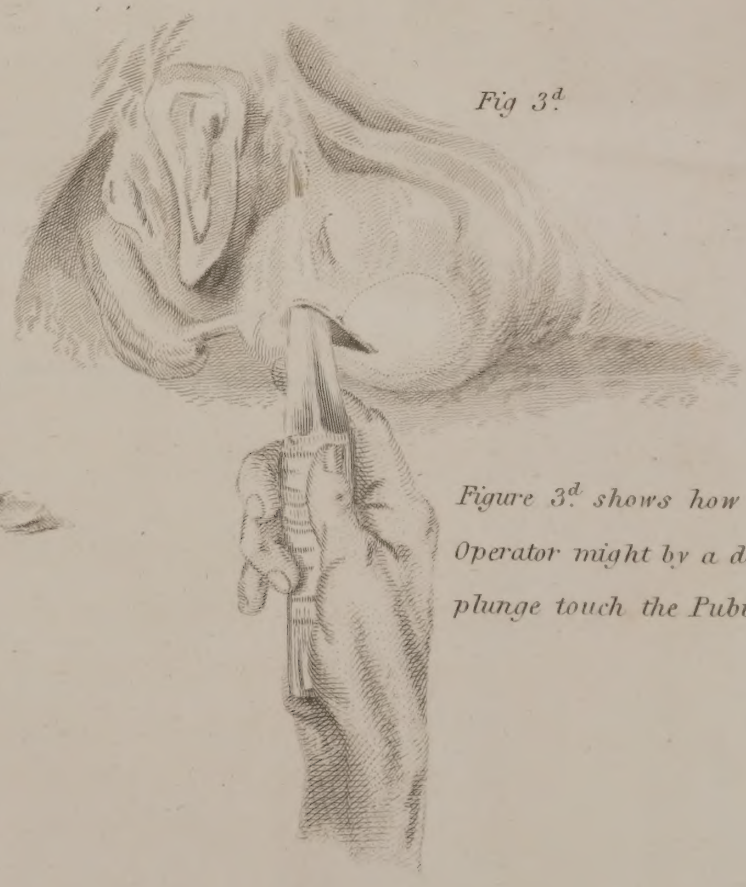

Figure 3d shows how a rude Operator might by a desperate plunge touch the Pubis.

Fig. 5th

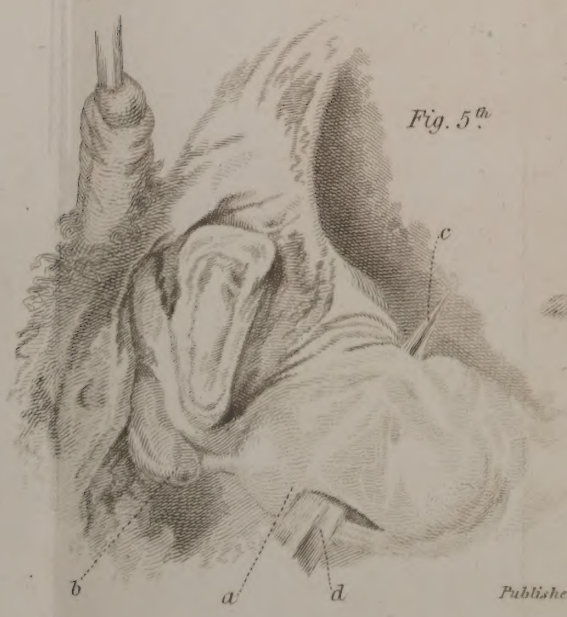

Fig. 6th

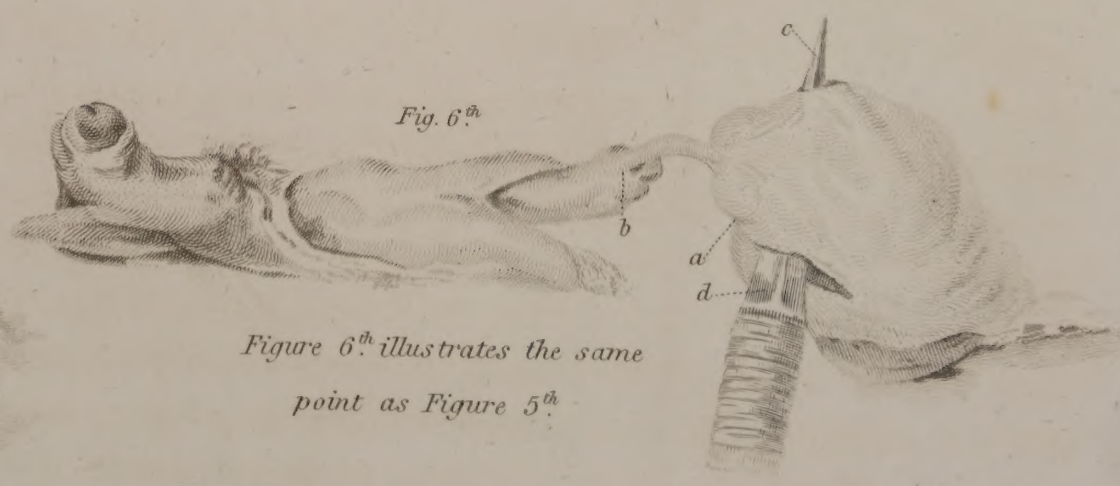

Figure 6th illustrates the same point as Figure 5th

Drawn by I. Bell.

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paratus major: he was aware that the great miſtake was, making the wound in the perinæum over the root of the penis, and not in the hip, over the neck and body of the bladder, for in his own vindication he ſays, "Frere Jaques had remarked that the dangers and injuries of the old inciſion proceeded chiefly from the wounding of the root of the penis, where its cavernous bodies join; and that to avoid theſe dangers the inciſion ſhould be made in the neck of the bladder:" Behold here the motive for making his inciſion in the hip, and ſuch an inciſion muſt have had all poſſible facilities and muſt eſpecially have enſured the expeditious extraction of the ſtone: The apex of the hip is the tuberoſity of the iſchium! When Frere Jaques ſtruck his knife by the ſide of the tuber iſchii, he opened that great hollow which was left cloſed by its muſcles in the inciſion of the apparatus minor! and the dividing of thoſe muſcles is eſſential (whatever way the operation is performed) to the eaſy extraction of the ſtone. By ſtriking the knife by the ſide of the tuber iſchii he divided the tranſverſe muſcle: by moving the knife ever ſo little, to enlarge the wound upwards and downwards, he cut all the muſcles entirely acroſs, and opened ſo completely the great hollow, that every reſiſtance on the part of the perinæum was removed.—This praiſe of dividing all the muſcles, even the enemies of this operation allow him. Mery was ſurpriſed into a favourable report; "His inciſion," ſays Mery, "proceeds in the middle line, betwixt the accelerator urinæ and erector penis, without wounding either, and opens all the neck of the bladder and half an inch of its body." The figure (fig. 1.) which I have ſketched to illuſtrate this point, is moſt important; it is applicable to every ſpecies of lithotomy; it is a plan of thoſe muſcles of the perinæum of which I have already given a correct drawing; it ſhews the penis thrown back over the lower part of the belly; the groins much ſtretched as in lithotomy; the ſcrotum ſtrongly corrugated; and the dotted lines mark that triangle in which the inciſion is to be performed. The ſurgeon muſt remember that this triangle is bounded by the two legs or branches of the os pubis; that the crura penis ariſing from theſe branches lie along the ſides of the triangle; that the erectores penis muſcles, marked by the dotted lines (b b), lie upon the roots of the crura penis; that the bulb of the urethra, lying immediately under the middle of the arch of the pubis, occupies all the perinæum from the ſcrotum to the anus; that on the bulb lies the accelerator urinæ muſcle, marked by the dotted line (c); that the great hollow under the tuber iſchii, the centre of this opening of the pelvis, and the only ſpace through which the ſtone can be extracted, is croſſed by the Tranſverſalis Perinæi, marked by the dotted lines (d d); and that Frere Jaques's

inciſion is the true inciſion of lithotomy: firſt, becauſe it cuts the tranſverſalis perinæi acroſs and does away all reſiſtance on the part of the muſcles: ſecondly, becauſe it completely opens that hollow place by the ſide of the rectum in which the cervix veſicæ lies and through which the ſtone muſt paſs. The line of Frere Jaques's inciſion is deſignated by the dotted line (e); and it is ſeen that the line of inciſion turns over the hip, and that as much of it is behind the anus, or in other words, behind the tranſverſe muſcle, as before it; and that ſuch a wound whether made by a ſtab as by Frere Jaques, or by, firſt, a ſuperficial inciſion, and then a ſlow diſſection as in our manner of operating, is ſtill the true inciſion of lithotomy: Let the ſurgeon keep theſe points in mind, and compare this ſcheme with that which accompanies the operation of the apparatus major.

SECONDLY,—Why Frere Jaques did not uſe a grooved ſtaff, and how he could uſe a round one, is matter of difficulty and ſurpriſe to many who have deſcribed his operation; the deſcription of this part of his operation involves ſingular conſequences, and is the theory of all his miſconduct, for he did not penetrate, as we do, by a gradual diſſection, ſtopping upon the face of a grooved ſtaff, but ſtruck his knife at once into the bladder; he went beyond the ſtaff till the point of the knife paſſed the bending part of the ſtaff and the blade lay acroſs it; as he did not cut upon the face of his ſtaff, the ſtaff was not grooved; as he cut in the bend of his ſtaff it was remarkably curved at the heel; his knife, when he ſtruck it into the cavity of the bladder, paſſed through what is called the body of the bladder cloſe behind the proſtate gland; and when he drew it towards him to complete his inciſion, he opened the neck of the bladder and the proſtate.—This is an unthought-of manner of acompliſhing the internal inciſion; viz. cutting along the bend or concave of the ſtaff. Figure 2. illuſtrates this inciſion, where the ſtaff (a) is ſeen to have a prominent heel and a bold curve; where the dagger-ſhaped knife (b) is laid acroſs the bend of the ſtaff; where the portion (c) of the knife, that is within the bladder, lies in ſuch a direction, that, being retracted in the direction of the dotted line (d), it cuts up the whole length of the neck of the bladder, and the whole of the proſtate.

THIRDLY,—It is matter of ſurpriſe how, with a ſtaff thus paſſed into the bladder, he could cut the urethra entirely away, or how, the operation being eſſentially good, ſuch diſmal conſequences could enſue from his irregular inciſions. Morand confeſſes that he is altogether at a loſs to imagine how he could divide the arteries going to the root of the penis, or occaſion ecchymoſis behind the pubis, and extravaſation of blood within the abdomen. The truth is that the inciſions of Frere

Jaques, in his firſt operations, were as irregular and dangerous as his inciſions in his latter operations were correct and ſure. His firſt operation was rude, unguarded, performed upon a big round ſtaff, it was a ſtab with his dagger-pointed knife, bold and ſucceſsful, in ſo far as regarded the extraction of the ſtone, but diſmal in its conſequences as it related to the fate of the patient; in this operation he ſtruck at once into the body of the bladder, and his knife was ſtopped only by encountering the ſtone. His ſecond operation, taught him by Du Verney, Fagon, and Hunauld, was performed by ſucceſſive inciſions, like thoſe of the modern lithotomiſt, by which he cut towards his ſtaff: he opened not the body of the bladder, but the proſtate; his knife never entered into the bladder, but was ſtopped by the groove of the ſtaff; it was by running the knife along this groove that he ſlit up the gland and cervix veſicæ.

Let us then obſerve the effects of thoſe two inciſions.

ACCIDENTS OF FRERE JAQUES'S ORIGINAL AND UNCORRECTED OPERATION.

To the unremitting, I had almoſt ſaid the unrelenting labours of Mery, we owe an ample catalogue of the errors which were or might be committed in performing this operation; and there is not one of the uſual misfortunes of Frere Jaques's practice that may not be referred to his thus paſſing his knife over the bend of the ſtaff.

First,—In ſtriking in his knife, the diſtance being great betwixt the hip and the bladder, he often miſſed his way and mangled the parts by ſucceſſive ſtrokes. In our modern way of operating we go on by a ſlow and gradual diſſection, becauſe we know the parts! we cut from above downwards, and carry the point of the fore-finger of the left hand before the knife, while we are diſſecting with the right! we preſs aſide the rectum till, in the courſe of diſſection, the knife reaches the bladder ſafely: He, on the contrary, cut from below upwards, ſtriking his knife at once into the bladder, and his knife in his more fortunate operations glided ſafely by the ſide of the rectum, to that part of the body of the bladder which lies upon it: but when he deviated from the true direction, his knife wounded the rectum in paſſing; this wound, as it cauſed an iſſue of fæces and often a fiſtulous ſore, he was not willing to acknowledge. In operating on women, his knife wounded the vagina, and blood flowed from its orifice; but as this was not a mortal nor even a

fiſtulous wound, he ſpoke of it very ſlightly and ſaid, " he often wounded the vagina." When, in place of deviating towards the ſide of the rectum or vagina, his knife glanced upon the bone, it there wounded the great pudic artery, the patient then bled profuſely, and ſometimes died; for his knife paſſed, of neceſſity, betwixt the rectum and the pudic artery, which are but narrow limits for a rude operator unacquainted with anatomy.

SECONDLY,—In drawing back his knife by which he completed the inciſion of the proſtate; his knife, being turned acroſs the bend of the catheter, ſometimes projected too far, and transfixed the oppoſite ſide of the gland; upon being retracted, it ſlit up the gland, and membranous part of the urethra on both ſides; and in turning over the round catheter at the end of the inciſion, cut the little of the urethra that remained undivided: thus it often was found, upon diſſection, that he had cut the urethra fairly off from the neck of the bladder, and it was ſhrewdly ſuſpected that where he had only weakened the urethra by this circular inciſion, he completed the ſeparation of it by puſhing againſt the gland with his clumſy finger, or with a conductor, for he often uſed one. Theſe are warnings then to the modern lithotomiſt, in whoſe operation the ſame accidents happen by moving the knife with a circular motion, or by cutting the urethra by ſucceſſive ſtrokes. This poſture of the knife laid acroſs the bend of the ſtaff, and transfixing the bladder near the neck, is illuſtrated by fig. 5. where it is very obvious, that in the retraction of the knife from (a) to (b), the urethra will be ſlit up on both ſides, and very little of it left to connect it with the bladder; but if towards the end of the inciſion, the point (c) of the knife was raiſed ever ſo little, and the heel (d) carried round under the catheter, the urethra would be entirely divided.

THIRDLY,—It muſt be remarked that Frere Jaques knew that he had ſtruck his knife into the bladder, only by the urine flowing off: the moment the urine flowed off, the bladder was contracted round the knife and the ſtone: the patient is, during this moment of acute pain, irreſiſtibly inclined to preſs, as if diſcharging his urine, and the mere contraction of the bladder, much more the preſſure of the abdominal muſcles, puſhing down the viſcera from above, muſt preſs the fundus of the bladder againſt the knife! thence every motion of the knife, in ſuch a condition of the parts, muſt have been dangerous. The original operation of Frere Jaques, and of his maſter, Pauloni, was that by the apparatus minor; this operation they continued to perform, and had taken their lateral operation from it, ſubſtituting merely the ſtaff as a director for the ſtone, which alone directs

the ſurgeon in operating by the apparatus minor. They had transferred many of the rules of the apparatus minor to their new operation with the ſtaff, and eſpecially this, that Frere Jaques in feeling with the point of the knife for the ſtone groped at the ſame time above the pubis with the left hand, forcing the bladder to contract and preſs down the ſtone.—" Thus," ſays Dionis, " did he often preſs the fundus of the bladder againſt the point of the knife."—" He ſucceedeth better," ſays Buſſiere,* " when the ſtone is big and large, than when it is ſmall, by reaſon that a big ſtone not only extendeth the bladder, but ſtoppeth the point of the knife." No one will be ſurpriſed, as Morand was, that ecchymoſis was found behind the pubis, or extravaſations of blood within the pelvis, or abdomen; or that the veſſels at the root of the penis were divided; ſlighter deviations than thoſe deſcribed in the operation of Frere Jaques might turn the point of his knife to any of theſe parts. Neither will the modern lithotomiſt forget the contracted ſtate of the bladder, when the gorget is driven home into its cavity, for at that moment the urine is expelled, the bladder corrugated, the bowels depreſſed by the ſtraining of the abdomen, and the fundus of the bladder is in continual contact with the ſharp edge of the gorget.

Fourthly,—It is particularly worthy of notice; it is a point already touched upon in deſcribing the anatomy of the pelvis, and deſerving to be, on a future occaſion, more particularly explained; that by cutting thus from the hip towards the body of the bladder, in the deepeſt part of the pelvis, by wounding more of the body of the bladder than of its neck, there enſue fiſtulas of the cellular ſubſtance, and fœtid ſores, which, as much as the more deadly accidents, contributed to bring the operation of Frere Jaques into diſgrace.

Of this firſt operation then what can we ſay but that it partook of the genius of its inventor, a rude bold man; that it contained the elements of a good operation, but that the operator was expoſed to numberleſs errors, which, for want of education, he could not eſcape. Frere Jaques, whoſe operation was ſucceſsful only in the expeditious extraction of the ſtone, was, after a momentary enthuſiaſm in his favour, utterly forſaken even by his friends, and driven out of the city to go his old courſe round the provinces.

* Vid. this letter in the Philoſoph. Tranſact. anno 1699.

EXCELLENCY OF HIS SECOND OR CORRECTED OPERATION.

But his ſecond operation was the reſult of aſſiduous diſſections of theſe parts. In his new or reformed operation he uſed his dagger knife no longer, but diſſected with an ordinary ſcalpell upon a grooved ſtaff. The diſſection was as ſimple as that of the apparatus minor, with this difference only, that the projecting of the ſtaff directed the inciſion inſtead of the protruſion of the ſtone. Though by the ſlow and complete diſſection of the parts, the perinæum was completely relaxed, and the tranſverſalis and levator muſcles divided; though the external inciſion correſponded preciſely with that of his original operation, yet the inward inciſion was eſſentially different: in place of going ſo deep, or ſtriking the knife through the cellular ſubſtance that ſurrounds the rectum, or ſeeking the body of the bladder, the neck only of the bladder and the ſurrounding proſtate were cut; and they were divided by a fair, regular, and limited inciſion, the knife being run through the body of the gland along the groove of the ſtaff. The rectum and the pudic artery were equally out of danger, for the knife did not go ſo deep, and was not plunged blindly among the parts. The extraction of the ſtone was eaſy and expeditious. The external and internal wounds correſponded, and were oppoſed to each other ſo that there was no cavity formed among the cellular ſubſtance, nor fiſtulas, nor tedious cures.

His operation was from this time perfect, and for this invention Frere Jaques ranks in that ſtation, univerſally aſſigned him by a profeſſion now impartial and grateful, and the operation thus improved by the heads of Fagon and Du Verney, and the bold hand of this operator, was ſuch as left for Rau, and the furious rivals of Frere Jaques, nothing to improve in reſpect of the deſign, and, in reſpect of the manner in which it was performed, every thing to envy. Rau did not improve this operation! it was delivered perfect into his hands! he had indeed the advantage of performing it with the ſkill of an anatomiſt, and the courage of an experienced ſurgeon; but he had the meanneſs, never to be forgotten, of concealing from the world the preciſe manner in which he practiſed an operation which he was taught freely, by one whom he affected to deſpiſe, and contrived to ruin.

Thus do we owe to this illiterate man, whoſe modeſty, humility, and courage, whoſe charity, ſimplicity, and goodneſs, we muſt hold in reſpect, an operation which

has been approved of and performed by all the good lithotomiſts of Europe; and from his life and fortunes, one important leſſon may be deduced; we may learn how ſlightly we ſhould rely on our natural talents, how little faith we ſhould have in mere courage!—this intrepid fearleſs man committed nothing but butcheries, while he remained what has been termed a natural operator; but after having undergone the diſcipline of ſcience, and learnt the anatomy of the parts, he became truly valuable.

RAW'S METHOD OF PERFORMING LITHOTOMY.

Joannes Jacobus Raw, the moſt famous lithotomiſt of modern times, was born in the village of Baden in Swabia, in the year 1668, of parents far from wealthy; his father a wine-merchant, unable to give his ſon an education ſuitable to his genius, bound him apprentice, at fourteen years of age, to a ſurgeon in Straſburg, where he lived three years. At the end of that period, neglected by his parents, and unable to ſubſiſt at home, he began to wander far and wide through the world, ſcantily ſupplied with the means of travelling, or even with the neceſſaries of life. After paſſing through a great part of Germany, he arrived at Hamburgh, and having taken his paſſage for Bergen in Norway, he then entered into the ſervice of one Frawen, a ſurgeon; but could not long remain, being unable to endure the extreme cold of that country. It was eaſy to procure a paſſage to Amſterdam, for the intercourſe was then, as it always has been, very great, betwixt the countries. He accordingly embarked for Holland, and upon his arrival was received as ſurgeon in the ſhip of Count Benthem, with whom he viſited Spain and various parts. He had the good fortune to arrive again in Amſterdam, at the critical moment when King William was about to ſail for England with a gallant fleet, and was appointed ſurgeon to the vice-admiral Skey's ſhip.

Thus did Raw ſpend his firſt years in an unſettled and miſerable way of life, in the ſociety of men rude and brutal! the wages earned thus amidſt hardſhips and perils, he did not ſquander, but hoarded with particular care, whether animated by that ſordid paſſion for gain which ſtrongly marked every future action of his life, or from a more generous deſire of renewing his ſtudies and improving his mind, we dare not ſay. This only is certain, that on his return to Holland he betook himſelf to Leyden,

and there ſtudied all parts of learning with great ardour; and, having made himſelf acquainted with the doctrines of medicine in that ſchool, he travelled into France, and ſtudied anatomy and ſurgery in Paris under the beſt maſters: he diſſected much with his own hand; Du Verney was his chief preceptor, and Mery taught him the diſtribution of the nerves: under Myſhevius he learned to reduce luxations; and he followed Petit, then an old man of eighty years of age, Marechal Rowmart, and the great maſters of Paris, obſerving their practice in all the varieties of ſurgical diſeaſe.

Wearied at length of this wandering life, he returned into Holland and eſtabliſhed himſelf in Amſterdam, where he taught anatomy and practiſed ſurgery. While Raw, ſupported by the magiſtrates, and ſupplied with dead bodies, was lecturing in Amſterdam and performing the operations of the hoſpitals, Frere Jaques by chance arrived in that city, and performed his new operation, which Raw was always preſent at, and always loudly and violently condemned. Theſe invectives of Raw gave offence at firſt, and he was obliged to be ſilent for a time, but the event ſoon juſtified his predictions and induced the magiſtrates of the city to withdraw their confidence from Frere Jaques, and commit the poor, afflicted with the ſtone, into the particular care of Raw: he was elected lithotomiſt of the city of Leyden; his fame and reputation increaſed daily; pupils came to attend him from all the diſtant countries, and throughout all Holland he alone was called to perform the great operations, eſpecially that of cutting for the ſtone. He was ſoon invited, from a ſenſe of his uncommon talents, to teach anatomy in the public theatre at Leyden; and upon the death of the celebrated Bidloo, he received the crown and laſt reward of all his labours, being called to that chair which the counſellors and governors of the univerſity and the magiſtrates of the city pronounced him alone worthy to fill. Raw now forſook, with great reluctance, the ſociety he enjoyed in Amſterdam, where he had lived happily with his friends; the little pleaſures and indulgencies he enjoyed had become with him a ſecond nature; he could not but foreſee many unhappineſſes ariſing from this ſudden change in all the habits of his life, and the loſs of thoſe friendſhips which had been the chief pleaſure of his leiſure hours.

Yet he accepted the place; he was, in the year 1713, inſtalled in his office, and pronounced his celebrated oration on the teaching and improvement of anatomy; and ſoon after he attained the higheſt rank in the univerſity, being elected Regent.

The labours of this ſtation he undertook while in perfect health and vigour, nor

did he ever relax in the arduous duties of his office while health and ſtrength remained. But it unfortunately happened about four years before his death, that by a fall he ſprained his foot. At ſuch a period of life, after many years ſpent in ſtudy and labour, the ſpirits and health and whole frame of mind are apt to be affected by the moſt trivial cauſe. The pain occaſioned by this accident confined him for ſeveral months to bed, and when the pain ceaſed, an odema remained. The long ſilence and ſolitude of confinement ſucceeding to the buſtle of an active life, brought on melancholy and hypochondriaſis; the paroxiſms of this moſt afflicting diſeaſe were for two years frequent and diſmal; and the year before his death he ſuſtained a ſtroke of apoplexy. From this period, his health and bodily frame was entirely ruined; he was afflicted with ringing in the ears, an evening fever and night ſweats, by which his ſtrength was exhauſted. His melancholy increaſed to the moſt afflicting degree; the ſlighteſt noiſe alarmed him; the ringing of bells, the crowing of cocks, the voices in the ſtreets, brought on intolerable anxieties, till at laſt this melancholic delirium ended in madneſs: he, after four years of ſuffering, expired loaded with fame, riches, and honours, beyond his moſt ſanguine hopes: he died on the 18th of September 1719, and was buried in the great church of Leyden.

"Raw was of a robuſt and manly form, his countenance ſomewhat ſevere and ſtern: he was of a generous, active, and fiery ſpirit; ingenious, laborious, covetous of honour, ſeeking it, not by art but by his own honeſt deſerts: he lived an unmarried life, ſober and frugal, yet he was generous and cheerful with his friends: he was incapable of flattery, diſſimulation, or cunning, unſparing in his cenſures, diligent in correcting thoſe errors which affected his profeſſion, ſevere in his invectives, eſpecially againſt thoſe who erred in matters of ſcience; but this ſpirit we aſcribe not to a love of ſatire, but to a certain enthuſiaſm and love of truth, and to a proud confidence in his own natural powers. To remember his boiſterous manners or rude ſpeech as a ſubject of reproach, were moſt ungenerous, for he lived a miſerable and wandering life during thoſe early years in which the mind, ſoft and pliant as wax, receives too eaſily the impreſſions of ſurrounding objects, and is formed by chance and by the ſociety in which we live! no, it is rather a matter of wonder that he became ſo great a man *."

* "Fuit autem corpore magno et robuſto, egregiaque et virili plane forma, vultu ſevero, et torva nonnihil tuente. Fuit animo generoſo, promto, et alacri; totus tamen paulo fervidior atque commotior. Cæterum ingenioſus, laborioſus, et attentus; atque gloriæ ſemper cupidiſſimus, quam non arte ſed aperte palamque meritis ſuis acquirere ſtudebat. Vixit in cœlibatu, parce et ſobrie; libere tamen, et cum amicis hilarus. Adulari admodum

Theſe are the ſlight memorials left us by Albinus of the celebrated Raw: his ſpirit of enterpriſe and love of ſcience; his diligence in ſtudy, and his frugal and ſimple way of life; the fortitude with which he reſiſted the corruption of bad example, and the ſteadineſs with which he reſerved the earnings of a ſevere and laborious profeſſion, to enable him to renew his ſtudies at an advanced period of life, are moſt commendable. The perſeverance with which he ſtruggled, during the early part of life, againſt penury and want the res anguſta domi, gave proof at once of his excellent genius and conſummate prudence. "The nobleſt blood in all the land's abaſhed, having no lackey but pale poverty*." He ſtudied anatomy, not by reading nor by diſſecting animals, but by diſſecting the human body; this he regarded as the firſt and moſt eſſential point of his education, and ſpared no expence, no travail, no ſolitary labour, to attain to a perfect knowledge of the ſtructure of the human body: he was ſoon diſtinguiſhed as the firſt ſurgeon of his age, and certainly was the moſt celebrated lithotomiſt that ever lived. Before publiſhing his oration, he had cut one thouſand five hundred and forty patients for the ſtone †. His operations were attended by ſtudents from all parts of the world, and after his death his method of operating was imitated by all the ſurgeons in Europe. One thing is ever to be lamented, that this great man had contracted, in his years of penury, not merely habits of laudable œconomy, and a decent reſpect to the neceſſary affairs of the world; he was viſited early in life with that mean vice which eats up every virtue, grows continually as we advance in years, and in our liberal profeſſion deſtroys the ſeeds of charity and every generous ſentiment. This ſin of uncharitableneſs, Albinus his friend and favourite would fain conceal; but whatever might be due to Raw from his fellow citizens, from thoſe who felt the immediate benefit of his ſkill, on poſterity he has no claim! his ſordid temper made him commit an unpardonable crime againſt his profeſſion, and the intereſts of humanity: he concealed his operation to the very moment of his death!

non poterat, neque ſuſtinere diu ſimulationem. Itaque minime facile et diu parcere ſolebat, ſed alios reprehendebat. Errores evellere conabatur; in multos vehementius quoque invectus, præſertim ſi quos in ſua arte à vero abeſſe exiſtimaret. Quod eum non tam carpendi aut lædendi libidine feciſſe credimus; quàm veritatis aſſerendæ et defendendæ ſtudio atque impetu quodam, et quòd non prorſus abjecte de ſe ſentiret."

* "Haud facile emergent, quorum virtutibus obſtat
Res anguſta domi."

† To cut one patient daily it would take him three years to accompliſh this number; but even this ſurpriſing number he had cut at an early period of his career. It is probable that as he cut almoſt every day, he had cut to the number of three thouſand and more during his life.

When firſt Raw cut for the ſtone, he performed the Marian operation with all the apparatus, opening the urethra by cutting, as he had been taught in Paris, upon the perinæum, not upon the hip. When Frere Jaques firſt appeared in Holland, Raw was by virtue of his office and by authority of the magiſtrates preſent at his operations, and had the privilege of opening the bodies of thoſe who died; from him he avowedly learnt the operation which he afterwards performed, and it will be recollected that Frere Jaques, at this time rude and ignorant of anatomy and all the ſcientific rules of operating, ſtruck his dagger-like knife into the body of the bladder, cutting from the point of the hip. Raw had no higher ambition at this time than to correct the irregularities of this mode of inciſion; and he profeſſedly divided, in his new operation, the ſame parts which were divided by Frere Jaques. "His deſign was not to divide the neck of the bladder as in the earlier operations, nor the urethra as in the uſual operation of the apparatus major, *but the body of the bladder near its neck, towards the ſide and lower part*, an inciſion (ſays Albinus) which could not well be attended with any greater danger than thoſe in which the urethra or cervix are cut; and ſince in this inciſion the cervix veſicæ is left entire, neither wounded with the knife nor dilated with inſtruments, nor cruelly lacerated in extracting (as often happens) a large and rugged ſtone, the operation could not fail to be infinitely ſafer than that in common uſe."

"Propoſitum in hac operatione erat, non cervicem veſicæ incidere, ut primo fecerant, nec urethram, ut eo tempore plerique ſolebant, *ſed veſicam ipſam, proxime cervicem ejus*, à latere, nonnihil inferiora et poſteriora verſus. Quæ quidem veſicæ ſectio periculoſior per ſe multum eſſe non poterat, quàm vel cervicis, vel urethræ. *Et cum ſic urethra et cervix integra manerent*, et neque inſtrumenta introducendo et vi magnâ diducendo, neque etiam calculum, magnum ſæpe et ſcabrum aſperumque, violenter et crudeliter plane extrahendo, via hac neceſſario anguſtæ parteſque tenerrimæ læderentur; et multa quæ hæc conſequi fere ſolent maximaque mala præcaverentur, longe vulgaribus antecellere videbatur."

This his new operation, Raw performed with all the advantages of anatomical knowledge and ſurgical ſkill; but he could not be long inſenſible to the dangers of an inciſion which paſſes not through the proſtate gland and that part of the bladder which is the moſt directly oppoſed to the external wound, but into the body of the bladder behind the gland, at the part where the bladder lies deep within the pelvis, and is almoſt inacceſſible to the moſt dextrous ſurgeon. While Raw was meditating on theſe dangers, and conſcious of the ill conſequences inevitably

reſulting from this deep inciſion, Frere Jaques appeared again, and it will be recollected that he now performed a new operation corrected by Fagon and Du Verney. "He had," as he whiſpered to Salzmannus, "left off his former raſh way of operating and cut now upon a grooved catheter." He cut not into the body of the bladder, but into the neck of the bladder, through the ſubſtance of the proſtate gland. This was the operation which Raw learnt and adopted; the uſe of a grooved catheter was the ſole invention boaſted of by Raw or claimed in his favour by his pupil Albinus.

"Itaque negari quidem non poteſt præiviſſe Rauio Fratrem Jacobum: hoc tamen ei hodieque et ſemper eſſe debet laudi maximæque gloriæ, quòd peritia, ingenio, et induſtria ſua, id addiderit, quo ſolo curatio, cæteroquin incerta, periculoſa, et plerumque pernicioſa, reddita eſt certa, tutior, et cæteris forte melior et præſtabilior. *Addidit autem catheterem, ut vocant, qui gibba ſui parte ſulcum profunde infiſſum haberet;* quem per urinæ iter in veſicam demitteret, et ad veſicæ locum, qui incidendus erat, gibbo ſuo apprimeret, ut eum cultrum porro dirigere, ſupra eum veſicam certo incidere, inſtrumentaque pro forcipe tutò rectàque dirigenda immittere poſſet, plane ut apparatu magno fieri ſolet."

By the valuable leſſons which Du Verney, Fagon, and Felix, gave to Frere Jaques, and by his confeſſion to Salzmannus, of an entire change in his operation, Raw was excluded from every claim as an original inventor; yet, as by his talents for operating he had become famous when Frere Jaques was dead, and he alone left to perform the operation, it became to him a ſort of property; he was ſuppoſed to have a peculiar method of his own; it was believed that he alone, of all the ſurgeons in Europe, knew the true method of Frere Jaques, the art of cutting with ſafety into the body of the bladder, behind the gland. He had indeed done ſo in his firſt operations; and now his reputation being involved, it became his intereſt to deceive the profeſſion into a belief that he continued to perform this juggling trick of cutting entirely behind the proſtate gland.

We are now arrived at that part of our narrative which we enter upon with reluctance. Raw had learnt his operation from this open and ingenious man, "whom he affected to deſpiſe and conſpired to ruin;" the ſin of his ingratitude ſtands indeed the moſt prominent point in his character: but there is another accuſation of a blacker die; his ſordid temper induced him to do a deep and irremediable injury to that profeſſion of which he was a ſworn ſupporter. Raw, a man of ſcience, a profeſſed teacher of youth, whoſe appointed office it was to inſtruct them the manner of

performing ſurgical operations, refuſed to explain this operation in which he particularly excelled. Heiſter, who was among the pupils of Raw, ſeems to have felt an honeſt indignation at his conduct, and has commemorated the ſordid temper of his unworthy maſter. "Raw," ſays he, "alive only to motives of gain, concealed his operation from all his pupils, and from myſelf; he would not teach us how to perform it, leſt his own profits ſhould be leſſened; a meanneſs which every man of dignified ſentiment muſt hold in contempt, preferring ſincerely the public welfare to his private gain *." All the profeſſion was diſguſted with his ſentiments and conduct: his expreſſions were equally mean, rude, and unmannerly: he told his pupils, "that as for this operation, he was to gain his bread by it, and never would ſay one word about it as long as he lived; and that if they did prevail with him to ſpeak on this ſubject, they would do wiſely not to believe what he ſaid." Theſe were the familiar and blunt expreſſions of this rude man, who often however condeſcended to uſe more polite and ſcholar-like expreſſions, ſaying to thoſe who aſked him to diſcloſe his ſecret, "Legite Celſum." His ſecret! he had no title to reſerve from the world one point of knowledge even the moſt trifling: he was equally bound by humanity and duty to diſcloſe his operation: the patrons of the univerſity, and the magiſtrates of the city, in appointing him to ſo high a charge, bought his time, his talents, and all his petty ſecrets, with honours, of which he ſhowed himſelf but little deſerving.

The anxiety of the profeſſion to diſcover the operation of Raw never ceaſed, and thoſe were held in ſome eſtimation who were ſuppoſed to know and practiſe it. Dennis, a ſurgeon in Holland, took advantage of this temper, and made one experiment more upon the credulity of the public; he gave the public to underſtand that Raw whiſpered to him, with his dying breath, the full and true account of his operation, and that he, Maſter Dennis, continued the depoſitory of this *important and beneficial ſecret:* the ſordid motives of Raw appear infinitely more offenſive in the perſon of this his wretched follower: his book, intitled Obſervationes Chirurgiæ

* Hoc olim celavit *valde ad rem attentus* Ravius, ſuis diſcipulis, et inter hos etiam Dom. Præſide (viz. Heiſter), dicendo ſe eos ſuam methodum non docere, ne ſcil. eam damnum poſtea inferrent: à qua vero turpi invidia vel avaritia, vir bonus, honeſtus, et cordatus ex Dom. Præſidis ſententia debet ipſe quam alieniſſimus et potius pro utilitate publica, quam pro propria ſollicitus eſſe."

"Enchyreſes ſuas celabat Raavius quærentibus, dicens aperte victum inde ſibi petendum eſſe, adeoque dum viveret, nihil de hoc ſe patefacturum eſſe, et ſi quid etiam dicere cogeretur, verum non dicturum eſſe." Breyer, page 495.

de Calculo, is apparently an earneſt expoſition of the dangers of the operation by the apparatus major, and a fair parallel of it with the lateral inciſions of Raw; while it is in truth but an advertiſement unworthy of a mountebank. This boaſted operation Dennis never has the honeſty to deſcribe, from the beginning to the concluſion of his treatiſe; the only paſſage in which he mentions the operation, is this: "Concludo itaque methodum Rawianam, *qua jam duodecim annis utor, optimam eſſe omnium* huc uſque inventarum." Whoever reads attentively this book of Dennis, will not wonder at this ſentence, nor expect a work like his to come to any more worthy concluſion. He deſigned merely to perſuade the world that the operation of Raw was the beſt poſſible, and that he, Mr. Dennis, knew how to perform, and had actually performed it for twelve years *.

While Dennis was thus repeating the offence and making a ſecret, in his turn, of the ſecret operation of Raw, the intereſts of humanity were ſuffering! all the ſurgeons of Europe employed themſelves in learning, by diſſection, this mode of inciſion, with no other guide than a confuſed tradition that Raw had opened only the body of the bladder behind the proſtate gland! while many were making experiments in

* Dennis publiſhed this inſignificant book in the year 1732; the ſentence quoted above is, to the beſt of my recollection, the only one in which he mentions the operation of Raw; he never deſcribes it, I am perſuaded he could not perform it; even this piece of cunning and his twelve years experience in operating, never brought him into repute. The tale he tells is, I believe, a falſhood; for however much he might be the favourite of Raw, his ſecretary, his confident, his aſſiſtant in operations, he knew nothing of what Raw did; he had but the diſguſting duty of aſſiſting an operator whoſe confidence he did not enjoy. If Raw was jealous of his pupils, would he not be jealous of ſo *excellent an operator* as Dennis? His aſſiſtants were thoſe againſt whom he had chiefly to be upon his guard, and I am perſuaded that he kept his ſecret from none ſo carefully as from Dennis, who ſometimes, and from Albinus, who often aſſiſted him. That Dennis received the account of this operation from Raw upon his death-bed, is inconſiſtent with every authentic hiſtory of the laſt hours, or even of the laſt years of this celebrated man, who lingered in a ſtate of melancholy, and died in paroxiſms of delirium and inſanity. A death-bed is indeed a time for telling ſecrets, but not of this nature, if the old gentleman had had a thouſand pounds hid under a tile, as might very naturally be, he might have told ſuch a ſecret to Dennis, who would have been fully as glad of this kind of ſecret as any other man; but that Raw ſhould ſit up in his bed in articulo mortis, take off his night-cap, and, holding maſter Dennis by the two hands, explain to him how to cut for the ſtone, is very unlikely.

Amſterdam has been, for time immemorial, the emporium of ſurgical ſecrets; the lever of Ruinhuiſen, the fillets and parturient pills of various diſcoverers among the Dutch, the undivulged arts of the celebrated Ruiſh, the mummy-making ſecrets of Bills, who boaſted that he could preſerve bodies either ſoft or hard as he pleaſed, and as freſh as if alive, are a ſort of vindication of Raw and Dennis. It was the faſhion of the times, and this was a country where they held a great trade in ſecrets, and were aſhamed of nothing that was any way profitable.

hoſpitals by which innumerable lives were loſt. Thoſe made in England were attended with the moſt diſmal conſequences, and the celebrated Cheſſelden was the man who had to lament and to confeſs the errors he had committed in attempting to imitate Raw.—"Raw," ſays Cheſſelden, "ſucceeded wonderfully, and if he, who was an excellent anatomiſt, may be allowed to have underſtood his own operation, it was directly into the bladder without wounding either the urethra or the proſtates. Beſides this, other competent judges who were the witneſſes of his operations have borne the ſame teſtimony."—* "Hearing then of the great ſucceſs of Mr. Raw, profeſſor of anatomy at Leyden, I determined to try, though not in the ſame manner, to cut directly into the bladder; and, as his operation was an improvement of Frere Jaques, I endeavoured to improve upon him by filling the bladder as Douglaſs did, in the high way with water, leaving the catheter in, and then cutting on the outſide of the catheter into the bladder, into the ſame place as upon the gripe, viz. in *the body of the bladder*, which I could do very readily and take out a ſtone of any ſize with more eaſe than the other way †." Thus was our great ſurgeon (not yet truſting to his anatomical knowledge, nor inventing an operation for himſelf,) ſeduced by this rumour of the ſucceſs of Raw, and of the depth of his inciſion; and by cutting thus deep behind the gland, Cheſſelden had the unhappineſs to ſee many of his patients die, ſprawling upon their belly with pain and agony. "My patients ſeemed," ſays Cheſſelden, "for ſome days out of danger, but the urine which came out of the bladder continued lodging upon the cellular membrane on the outſide of the rectum, attended with a vaſt diſcharge of ſtinking matter, and from this cauſe I loſt four patients out of ten." Cheſſelden, while attempting this innovation, ſaw, with vexation, ſcenes of terrible ſuffering: we find, by his own report, that after this operation, gangrenous abſceſſes and tedious ſores enſued; that his patients ſometimes ſprawled upon their bellies for a fortnight, writhing with agony, and ſuffering ſomething like a paralyſis of the lower extremities; from the extremity of pain ‡ after ſuch misfortunes, ariſing from the mean and covetous temper of Raw, it is impoſſible to think of him with reſpect.

We cannot read what Sandifort has delivered to us of the hiſtory of Albinus, without lamenting that he ſhould have been long the aſſiſtant without ever becoming the confident of Raw. The aſſiſtant is to the ſurgeon as a friend, adviſer, and

* Anatomy, page 326. † Ibid. page 328.

‡ Vide Appendix to the Anatomy, page 330.

counſellor, in all the difficulties of his operations, to whom he muſt entruſt, in ſome degree, his own reputation and his patient's ſafety, and to whom he owes in return every ſentiment of confidence and friendſhip. What ſhall we think of Raw, who kept even the celebrated Albinus an alien from his thoughts, and uſed him as a common aſſiſtant, as an unintelligent inſtrument in his hands?

"While Raw was a lecturer in Leyden, Albinus attended his leſſons with ſo much aſſiduity, that Raw, captivated with his perſonal attachment and enthuſiaſm in ſcience, willingly communicated to him every thing that was new or intereſting. He was ſo pleaſed with Albinus that, in difficult caſes and in all ſurgical operations, he choſe him for his aſſiſtant, eſpecially in operating for the ſtone. This operation, although improved by Raw, and performed by him more than a thouſand times ſucceſsfully, he never yet revealed. But ſuch opportunities had Albinus of remarking every ſtep of the proceſs, that no one ever did nor ever could deſcribe his operation ſo correctly *." Theſe are the words in which Sandifort deſcribes the affection of Raw for his celebrated pupil Albinus. Yet theſe are but ſlender grounds for the confidence with which Albinus has written the hiſtory of Raw's lithotomy. He could not be otherwiſe than extremely deſirous to learn the eſſentials of that operation, in the performing of which he was ſo often a party; he believed he underſtood it; he wrote freely what he knew; but we ſhall find in the ſequel that he was deceived; and it marks only more diſguſtingly the cunning of this Raw, and the pains he took to deceive, that he was able thus to impoſe upon the greateſt anatomiſt of the age.

Theſe traits of character are not without their uſe. I am conſcious that till I had inveſtigated the hiſtory and obtained as it were a perſonal knowledge of theſe great men; till I had reflected on their motives and weighed their talents and diſpoſition; I never could form a deciſive choice among the operations they

* "Vivebat tunc Leidæ, ex hâc noſtrâ introductione, jam notiſſimus Rauïus, artis anatomicæ atque chirurgicæ docendæ ac faciendæ dexteritate inclytus. Ad hunc itaque ſeſe applicuit; hujus prælectionibus ac demonſtrationibus tali aſſiduitate interfuit, ut is, captus tanti ingenii ſolertiâ et ardenti ſtudio, quicquid in arte eximii haberet liberaliter cum illo communicaret. Rauïus Albinum tantâ complectebatur benevolentiâ, ut in rebus difficillimis, et quando operationes chirurgicæ ipſæ eſſent inſtituendæ, Albinum comitem eligeret; præſertim cùm ageretur de calculo veſicâ exſcindendo: quam operationem, ab ipſo emendatam, millies et amplius cum ſucceſſu adminiſtratam, nulli revelavit; ſed toties, præſente Albino, inſtituit, ut egregiam omnes encheireſes ritè obſervandi occaſionem ipſi dederit non tantum, ſed etiam præ cæteris dignum habuerit, cui in poſterum, cùm ab itineribus rediiſſet, calculo veſicæ laborantes ſecandos commendaret: adeo ut nemo poſtea aut meliùs aut exactiùs ipſius methodum deſcripſerit vel deſcribere potuerit."

performed. I am ſincerely deſirous that my reader ſhould be acquainted with the opinions of the profeſſion; with the men who ſupported the reputation of ſurgery in its moſt flouriſhing æra! when anatomy was cultivated, and operations originally projected and executed by thoſe who were thoroughly acquainted with the anatomy of the parts! when Albinus, Raw, and Cheſſelden, were the firſt ſurgeons in their reſpective countries! when lithotomy was thoroughly ſtudied, and the peculiar advantages and faults of each method diſcovered both by experience and by diſſection.

The authorities I now proceed to quote ſhall be plain and direct, and ſhall relate to that point ſolely which is the moſt important of all, viz. WHETHER THE LITHOTOMIST SHOULD CUT INTO THE BODY OR INTO THE NECK OF THE BLADDER, AND IN WHAT FORM THE INCISION SHOULD BE PERFORMED.

When the memoir of Albinus was firſt given to the world, thus ſtood the doctrine: that, in cutting for the ſtone, it was eſpecially deſirable to ſpare the neck of the bladder and the ſurrounding proſtate: that, theſe parts being left entire, fiſtula and incontinence of urine would be as impoſſible in cutting from the perinæum as in cutting by the high operation above the pubis. This was a ſhort-ſighted precaution; for this very form of inciſion, which it was imagined muſt prevent fiſtulas, was the certain cauſe both of fiſtula and of every other danger.

The hiſtory of Raw's lithotomy, as delivered by Albinus, ſerved to impreſs this prejudice more ſtrongly upon the public mind. His narrative ſeemed to prove that Raw had operated according to theſe principles, and in imitation of the deep inciſion of Frere Jaques. Albinus, adding his own authority, argued that "the wound of *the body of the bladder could not be more dangerous than that of the urethra or cervix*, and that good anatomiſts could find no difficulty, at leaſt no inſurmountable difficulty, in cutting thus deep into the pelvis."

"It was the deſign of Raw," ſays Albinus, "to divide not the neck of the bladder, as in the earlier operations, nor the urethra, as in the uſual operation, by the great apparatus, but the *body of the bladder itſelf near the neck*, a little to one ſide, and towards its lower and poſterior part; an inciſion which ſurely could not be more dangerous than that of the urethra or of the cervix: and ſince, in this way, the urethra and the cervix are left entire, neither wounded with the knife nor dilated with inſtruments, nor cruelly lacerated by the extraction (as often happens) of a large and rugged ſtone, this inciſion could not but be infinitely preferable to that in common uſe. Yet this inciſion, though in itſelf ſafe, is difficult to perform,

ſince this part of the bladder lies very deep, only to be reached when the patient is laid ſupine, his knees raiſed, his thighs moderately bent, and held aſunder. Then, by cutting firſt the ſkin by the ſide of the anus, next proſecuting that inciſion obliquely inwards and upwards, the knife, thus directed, reaches the deſtined part of the bladder; and if theſe various inciſions be correctly made, there is no part in the way of the knife to create any real or inſuperable difficulty, though, no queſtion, both the thickneſs of the ſkin and muſcles to be diſſected, and the proximity of important parts which we muſt not wound, make this a very critical inciſion. Should the ſurgeon cut too deep, or decline ever ſo little from the true courſe of the inciſion, he is in danger of transfixing the bladder, or of wounding the rectum, the veſiculæ, or the mouth of the ureter, the erector muſcle, or the cavernous body of the penis, where it ariſes from the pubis: the urethra too may be wounded or entirely divided from the bladder. Nor is all ſafe even after the inciſions are rightly performed; for, in ſo oblique a wound, the forceps are apt to glide to one ſide, and, in place of entering in the right direction into the bladder, ſeparate the adjacent parts, and then the ſurgeon, opening the forceps, and ſearching in vain for the ſtone, ſeizes whatever is interpoſed betwixt the forceps and the ſtone, and not only fails in his operation, but, by lacerating the parts, brings the patient into imminent danger. Such misfortunes are well known to have happened in the practice of Frere Jaques, who, being ignorant of the ſtructure of the parts, had no rule to guide his knife or forceps by. Far from approving of his operation, I ſcruple not to affirm that his invention was dangerous to humanity and often fatal to the individuals who fell into his hands; better had it been that his method had never been imagined, were it not that it ſuggeſted to the celebrated Raw a more perfect operation; for Raw, thoroughly ſkilled in the anatomy of the parts, knowing correctly what parts ſhould be wounded and what avoided, was ſenſible that nothing was wanting to render Frere Jaques's operation perfect, except regulating the plan of the inciſions ſo as to *carry the knife fairly and directly to this part of the bladder;* and ſuch a form of inciſion did he invent and perform moſt ſucceſsfully."

" It cannot indeed be denied that Frere Jaques was his maſter; yet to Raw alone is to be aſcribed the merit of having by his knowledge and genius made that mode of inciſions, hitherto the moſt fatal or dangerous, the moſt ſucceſsful and certain of any, giving it a ſuperiority over all others. Raw added to the apparatus of Frere Jaques, a grooved ſtaff: this ſtaff he paſſed down the urethra, preſſing its

convexity ſo firmly againſt the part of the bladder that was to be opened, as to be felt in the perinæum: upon this he cut his outward inciſion; to this point he directed his knife, and upon this projecting part of the ſtaff he opened the bladder with certainty, and along this grooved part of the catheter he paſſed his conductor, and along the conductor the forceps were introduced, as in the apparatus major. But ſeeing that the ſtaff uſed by thoſe who cut upon the perinæum was too ſlightly curved to be eaſily preſſed againſt the body of the bladder, he invented a ſtaff differing in theſe reſpects from that in common uſe; firſt, where the ſhaft of the ſtaff ends and the groove and the curvature of the ſtaff begin, the angle was very acute: ſecondly, the ſtaff from the angle forwards was elongated into a ſtraight beak, that the operator might cut boldly along this part of the ſtaff, and, by moving his knife backwards and forwards, open the bladder with an ample wound. Theſe were improvements naturally ſuggeſted to him by comparing the anatomy of theſe parts with the general ſcope and deſign of the operation."

So much for the deſign: as for the manner in which he performed his operation, it is explained to us by Albinus, his favourite aſſiſtant, in the following words: " * Having placed his patient in the uſual manner, and paſſed the ſtaff, he took the handle of it betwixt the finger and thumb of the left hand; he inclined the handle ſteadily and gently towards the right groin, and preſſed it down upon the belly, ſo as to preſs the curve of the ſtaff (which in that poſture lies in the neck of the bladder) cloſe againſt the part that is to be cut, which, as has been already explained, is near the neck, towards its lateral and poſterior part: preſſing then the ſtaff from above, againſt this point of the bladder, he felt for it from below with the point of the right thumb, (preſſing againſt the ſoft part of the buttock to the left of the anus, betwixt it and the tuber or bump of iſchium, on which we reſt in ſitting,) and by preſſing alternately the ſtaff downwards with the left hand, and the thumb of the right hand upwards, he felt the curve of the ſtaff diſtinctly, and marked the place of the firſt inciſion: his mark was an inch or two finger breadths

* " Hinc catheteris manubrium, ſiniſtræ digitis et pollice prehenſum, leniter et prudenter verſùs ægri ventrem dextrumque inguen inclinabat; ut catheteris curvatura ſulcata, in veſicâ prope cervicem ejus hærens, applicaretur ad veſicæ locum incidendum, ad latus ſiniſtrum, et, uti dictum eſt in principio, *proximè cervicem, nonnihil inferiora et poſteriora verſùs*. Quo facto, catheterem leniter ad eum locum apprimebat, eodemque tempore dextræ pollicem extrinſecus admovebat ad mollem natium regionem, quæ ad ſiniſtram ani eſt, inter eum et oſſis iſchii tuber magnum quod ſedentem ſuſtinet, è regione curvaturæ catheteris. Tumque catheterem pollicem dextrum verſùs leniter impellendo, et viciſſim eodem tempore pollicem dextrum catheterem verſùs à ſiniſtris et inferioribus dextrorſum ſurſumque premendo, extrinſecus inveniebat et notabat locum, qui cur-

to the left of the anus, not nearer, leſt he ſhould touch the rectum, nor farther off, leſt he ſhould be obliged to make his wound too oblique. Yet, according to the age of the patient or the feelings of the parts, his inciſion varied: he cut his external inciſion ſometimes high, ſometimes low, ſometimes nearer, ſometimes farther from the anus; the curve of the catheter always ſufficiently denoting the elected point of the bladder. His external wound of the ſkin and fat he made from above obliquely downwards, inclining ſomewhat towards the tuber iſchii to avoid the rectum; but about this external inciſion he was by no means ſolicitous. As ſoon as the inciſion was made, he introduced into it the thumb of his right hand or the fore-finger, feeling carefully for the catheter, turning the catheter at the ſame moment with the left hand, ſo as to place the curve correctly againſt the part of the bladder that was to be opened. Having marked the place of the catheter, he withdrew his thumb, and introduced the point of his knife, but not deep, carried it cautiouſly towards the curve of the catheter which he had juſt before diſtinguiſhed with the point of the finger, and made his way towards it by diſſecting carefully all the intervening fibres; and leſt, in the courſe of this little diſſection, he ſhould wound the rectum, he uſually introduced his fore-finger into the anus. When by diſſecting thus he had nearly reached the bladder, he introduced the finger or thumb once more into the wound, feeling for the ſtaff and adjuſting its poſture, if it had been diſplaced by any motion of the patient; and, once more marking the preciſe poſition of the curve of the ſtaff upon which the bladder

vaturæ catheteris oppoſitus eſſet, cui nempe plaga primo erat infligenda. Is igitur erat ad latus ani ſiniſtrum, pollicem vel digitos tranſverſos duos circiter ab eo verſùs tuber oſſis iſchii remotus. Non propior ano, ne rectum inteſtinum facile læderetur; nec ab eo remotior, ne cultrum nimis oblique catheterem verſùs adigere neceſſum foret. Tamen pro ætate, proceritate, et variâ harum partium in multis conſtructione et amplitudine, modò propius anum, modò remotius ab eo, modò altius, modò demiſſius paullo, cutim incidebat; ſemperque locum intus veſicæ appreſſa catheteris curvatura ſatis indicabat. Invento loco, ibi primo cutem fere ſolam et pinguedinis pauxillum incidebat, plaga recta, longa ſatis, à ſuperioribus ad inferiora et exteriora, id eſt, verſùs oſſis iſchii tuber, nonnihil ducta; ut nempe à recto inteſtino recederet. Hanc autem primam plagam faciebat animo non valde ſollicito. Mox in eam plagam adigere dextræ pollicem, vel et indicem, eâ parte, quæ ungui opponitur, catheterem verſùs, quem ad locum veſicæ incidendum ſiniſtra, quantum poterat, applicatum tenebat; quærens iterum catheterem. Quo reperto, retrahebat pollicem, ſtatim cultri ſui apicem in plagam prudenter, nec alte admodum, immittebat, et verſùs catheterem, quem pollice paullo ante exploraverat, caute dirigebat, leviter diſcindens quibus occurrebat. Et ne ſic rectum inteſtinum facile vulneraret, plerumque digitum in anum ægri leniter prius dimittebat, ut recti inteſtini poſituram penitus cognoſcere, idque tanto certius vitaret. Cum ſic leviter ſcindendo fere ad veſicam perventum eſſet, iterum in vulnus introtrudebat pollicem indicemve, catheterem ut ante quærens, eumque, ſi ægri jactatione remotus forte eſſet, reſtituens, ſimulque accurate obſervans et memoriâ retinens locum poſitionemque curvaturæ cathe-

was next to be wounded! he moved with the greateſt precaution, intreated the aſſiſtants and the patient to be ſteady! The ſtaff he held ſteady with the left hand, and with the right he introduced the knife, and with the point of it he touched the ſtaff, but without cutting, only holding the point directly towards the ſtaff! Then he, with the utmoſt circumſpection and caution, ſtruck the point of the knife into the groove of the ſtaff, and was ſatisfied that he had accompliſhed his part of the operation when the knife and the ſtaff encountered each other, and when he could feel, by moving the knife from ſide to ſide, that it was fairly engaged in the groove. Then moving the point of the knife cautiouſly and ſteadily upwards and downwards in the groove, but more particularly downwards, and turning the ſtaff ſkilfully ſo as to favour the knife, *he opened the bladder* with a wound not remarkably wide." "The poſition of the ſtaff regulated the courſe of the wound, and directed it ſomewhat downwards and outwards, a direction which was neceſſary to prevent wounding important parts. His next care was to prevent the ſtaff ſlipping out of the wound, and, by introducing his finger, to aſcertain its ſize and feel it naked."

Albinus, in this deſcription, firſt plainly delineates the plan and theory of this operation. "It was the deſign of Raw to cut, in imitation of Frere Jaques, *the body of the bladder near the neck.*" Non cervicem veſicæ ut primo fecerunt, nec urethram ut eo tempore plerique ſolebant,—*ſed veſicam ipſam proximè cervicem!* and this word *proximè* is ſo abſolutely excluſive of the neck, that a more decided or more irrevocable word could not have been uſed. He next explains the innovations propoſed by Raw, viz. the uſing a grooved ſtaff with an acute angle at the place of its bending, and a beak ſo long as to lie deeper within the body of the bladder, and which, being preſſed ſteadily downwards, ſhould project that part of the bladder which was to be opened and be eaſily felt in the hip, betwixt the tuber iſchii and the opening of the anus. And, thirdly, he explains how the operation

teris, ſupra quam veſica ipſa proxime erat incidenda. Quod facturus, circumſpectius agebat; hortabatur et obſecrabat adjutores, ne ægrum ſe cluneſque præſertim ſuas jactare ſinerent; ægrum, ut ſe contineret; ipſe, catheterem ſiniſtrâ ad locum incidendum applicatum retinens, dextrâ confeſtim cultrum per plagam ad catheterem caute admovebat, ita ut ille non ſcinderet, ſed ut mucro ejus ad catheterem rectà tenderet. Tunc attente et prudenter operam dabat, ut cultri mucronem in catheteris ſulcum punctim dimitteret. Id autem ex ſententia ſucceſſiſſe ſciebat, quamprimum cultri mucronem et catheteri inniti, et in latus utrumque leniter motum ſulci parietibus retineri deprehendebat. Tunc igitur, cultri mucronem in ſulco catheteris circumſpecte et firmiter ſurſum deorſumque ducens, magis tamen deorſum, catheterem etiam cultro perite accommodans veſicam incidebat, plagâ non admodum magnâ."

is to be executed by making a large and free inciſion, diſſecting cautiouſly forwards towards the catheter, feeling it diſtinctly, placing it fairly, and opening the bladder by running the point of the knife backwards and forwards along the groove of the ſtaff, but chiefly backwards. In the courſe of this long, intereſting, and moſt circumſtantial deſcription, the body of the bladder is mentioned repeatedly; the proſtate gland never; the cervix or urethra once only, and that in contradiſtinction to the parts that are to be cut. "This is a wound certainly not more dangerous than that of the urethra or cervix." Could it be believed that after declarations ſo expreſs and deciſive, Albinus ſhould, in his latter days, in his days, I believe we may ſay, of imbecility and dotage, deny that he ever had repreſented the operation of Frere Jaques as performed by an inciſion through the body of the bladder?

No ſooner was the operation of Raw announced to the world by ſo great a man as Albinus, a ſkilful anatomiſt, the pupil, friend, and aſſiſtant of Raw, than all the ſurgeons of Europe entered upon the enterpriſe with abſolute confidence of ſucceſs. The experiments of the beſt anatomiſts were attended with the worſt conſequences; not only did they rarely ſucceed in cutting into the body of the bladder, but there was an irregularity in the effects of their inciſions very difficult to account for. "I performed," ſays Mr. Morand, "many experiments according to the very letter of the book (viz. the treatiſe of Albinus); the experiments were made in preſence of Meſſrs. Molinelli, Condoidi, and Pringle; one read the words of Albinus, another held the ſubject, while I performed the inciſions; and, though I operated with the ſame inſtruments, the ſame aſſiſtants, the ſubject carefully held in the ſame poſture, my inciſions took place in very different parts. 1ſt, In one body we found the great proſtate divided two thirds of its length. 2dly, In another body was divided part of the proſtate, and what is uſually called the neck of the bladder. 3dly, In a third ſubject we found that the knife had entered the body of the bladder in the middle betwixt the ureters. "Whence," ſays Morand, "we may infer that, ſince Raw did not chooſe to explain his method, no one could know how he conducted his knife, when within the wound, nor through what parts." * Morand was perſuaded that Raw had never cut thus behind the proſtate gland, but had performed in effect the operation of Celſus, cutting the neck of the bladder only, and not the body. He remonſtrated with Albinus on the imprudence of his report; and this was the firſt ſhock his vanity had received;

* Morand, page 102.

he was from this moment conſcious that Raw had kept him a ſtranger to his operation, and ſenſible of the full extent of the injury he had done to ſcience; by deſcribing, with ſo much confidence, an operation which he did not underſtand, he had led the whole profeſſion into a courſe of experiments full of danger.

Garengeot, who was tormented with an eternal deſire to learn every thing! to try every thing! to publiſh every thing! next made experiments ſimilar to thoſe of Morand. "We tried next day," ſays Garengeot, "four more operations, to aſcertain whether we could actually accompliſh the operation of Raw, as taught by Albinus: we tried whether it was poſſible to open the body of the bladder alone; but whatever pains we took in giving ſufficient curvature to the ſtaff, and in puſhing the biſtoury deep, with the deſign of ſtriking it into the extremity of the groove, we found inſurmountable difficulties; in every ſucceeding experiment, we approached nearer and nearer to the pudic artery, the wounding of which occaſioned the death of one half of the patients of Frere Jaques; the left ſide of the proſtate we never were able to avoid, and, in dividing it, we of courſe wounded the cervix; in ſhort it was rather from examining the internal than the external ſurface of the bladder, that we ſatisfied ourſelves of having opened the body of it. Thence we are perſuaded that Albinus never examined bodies operated on according to his own rules, and that, had Raw himſelf deſcribed his operation, he never would have ventured to affirm that he ſaved the urethra entire, and opened merely the body of the bladder! The knife can never reach the body of the bladder but through the urethra, except in theſe caſes of retention of urine, where the bladder, being greatly diſtended, projects on either ſide, and preſents itſelf to the knife *."

* "Nous fimes enſuite les deux jours ſuivans quatre autres opérations, pour voir ſi nous couperions ſeulement le corps de la veſſie, comme M. Albinus nous l'apprend de M. Rau: mais quelque précaution que nous aions priſe quelque courbée que fût notre ſonde et quelqu' avant que nous aions pouſſe notre biſtouri, à deſſein de faire entrer ſa pointe vers l'extremité de la rainure de la ſonde, et d'eviter par conſequent l'urethre; nous trouvions toujours de plus grands obſtacles; nous approchions toujours de plus en plus de l'artere honteuſe interne, dont l'ouverture a fait perir la moitie des tailles de Frere Jacques; nous n'avons jamais pû eviter la partie laterale gauche de la glande proſtate et par conſequent le cou de la veſſie; enfin nous avons toujours vû l'ouverture du corps de la veſſie plutot en dedans qu'en dehors. D'où nous concluons, que M. Albinus n'a jamais examiné de cadavres après cette opération; et que ſi M. Rau avoit lui-même rendu ſa methode publique, il n'eût pas avancé qu'il evitoit l'urethre pour n'attaquer ſimplement que le corps de la veſſie, puiſqu'il eſt impoſſible de

Conſcious of ſomething wrong, and thus aſſailed, Albinus could no longer refuſe thoſe explanations which the profeſſion required. Cheſſelden had declared it dangerous to attempt the operation which he had deſcribed; difficulties had been propoſed on all hands, and by Camper, his pupil and his rival, he had been queſtioned in a leſs friendly way; the beſt ſurgeons in Europe had attempted, in vain, to perform the operation which he deſcribed; ſo that ſome explanation was now due, both in deference to the public opinion and for the ſake of his own reputation.

Thus publicly and plainly charged with his raſhneſs, Albinus entered upon his exculpatory evidence, as the laſt ſolemn act of his life *. He denied the charge with vehemence, and claimed the privilege of explaining the words quoted by Sharp and Camper in his name †; and this is what he ſays: "I never did affirm that Raw cut the body of the bladder, but that ſuch was his deſign (propoſitum fuiſſet)." "This term, cervix, authors of various ages have underſtood variouſly. 'Le Dran and others underſtand it to be the beginning of the urethra, where that canal departs from the neck of the bladder.' The urethra, ſays Le Dran, aſſumes various names at the ſeveral diſtinct points; its beginning is named the neck of the bladder, and when the bladder is fully inflated, this neck forms a conical or funnel-like canal, leading to the bladder."—"Such," ſays Albinus, "is the deſcription of the part underſtood to be wounded by Raw ‡. What elſe indeed were we to underſtand? for Raw himſelf, when queſtioned concerning his operation, ſaid 'Legite Celſum;' and ſurely Celſus directs the neck of the bladder to be opened."—"I have," ſays Albinus, "in a patient cut by a ſurgeon of our city, ac-

faire la moindre diviſion à celui-ci, ſans que l'inſtrument tranchant n'entre par l'autre; à moins que ce ne ſoit dans ces grandes retentions d'urine, où la veſſie tendue comme un balon, ſe jette conſiderablement à droit et à gauche."

* De eâ quam olim prodidi, quum alia atque alia ſilente me ſcripta ſint, non committendum putavi, *ut à vitâ diſcedam priuſquam proferam quæ habeo.*

† Ignoſcant, rogo, viri egregii, ſi amor in eos meus non ſinit, ut adſcribi mihi vivente me patiar, quod non ſcripſi, quod mihi in mentem non venerat.

‡ "Cervix veſicæ, aliis collum, vocabatur principium itineris urinæ, quòd ab oſculo veſicæ procedit: quemadmodum ut ab aliis, ſic à Drane quoque, 'le canal,' inquit, 'qui eſt continu à cet orifice (l'ouverture de la veſſie) prend differens noms d'eſpace en eſpace à-meſure qu'il devient plus long. Son commencement ſe nomme le col de la veſſie. Lorſque la veſſie eſt ſouflée avec force, le col diſtendu par l'air qui le remplit forme une eſpèce d'entonoir continu à la veſſie.' Ac ſic intellexerat Sermes, locum incidendum indicans."

cording to the method of Raw, introduced my finger into the bladder, and perceived diſtinctly the orifice of it ſtill entire, the inciſion extending exactly to the orifice; to make ſuch an inciſion is much more difficult than to open either the urethra or the cervix, for this part of the bladder lies deeper, and is not ſo tenſe on the ſtaff *."—"One ſurgeon, of our city, Bortile, an ingenious and ſkilful operator, aſſuredly cut after Raw's method, though it is reported that he cut rather higher, the patient being laid more ſupine. His operations (ſays Albinus) I have often witneſſed, nor do I think there can be the ſmalleſt doubt that he cut at once the orifice of the bladder, the neck, and the contiguous part of the body. Cheſſelden, at the diſtance of many years, cut exactly the ſame parts. Perchet, Morand, Heiſter, and many others, cut not the body only, but alſo the cervix; and Heiſter, in an eſpecial manner, endeavoured to imitate, both upon the living and the dead body, the operation as he had ſeen it done by Raw. Our modern ſurgeons, beſides, continue to operate according to the deſign of Raw, and of Bortile after him. And I have myſelf (ſays Albinus) demonſtrated the ſame plan of operation to my pupils, on the dead ſubject, both before and after the biography of Albinus was made public †."

Thus had the common voice of the beſt ſurgeons and anatomiſts, in various countries, declared it impoſſible or dangerous to perform the operation imputed to Raw ‡: Albinus, ſtill alive, and in extreme old age, was calſed on to avow, or

* "Eamque partem incidere difficilius eſt quàm vel cervicem vel iter urinæ: nam et profundior eſt et non ita tenſa ſuper catheterem."

† "Eâdem quoque generaliter ratione quâ Rauïus, apud nos Bortel ſecabat, chirurgus noſtras, ut ſimplex, ſic peritiſſimus: ſecabat autem, ut aiebant, altius, nempe calculoſo ſupino. Vidi eum aliquoties ſecantem anno CIↃ IↃ CCXVIII; nec dubitandum eſſe putavi, quin cervicis multum, oſculumque, ac proximam veſicam incideret. Multiſque annis poſt, eundem demum locum Cheſſelden ſecuit; poſtque eum Perchet, et Morand, aliique. Et non ſolum veſicam, ſed cervicem quoque ejus, Heiſterus incidit, qui curationem quam Rauïum adhibere viderat in mortuis viviſque imitatus erat; eâque fere ratione, quâ aut Rauïus, aut deinde Bortel, ſecare noſtri perrexerunt. Eademque ſtudioſis medicinæ proceſſum curationis oſtendi in mortuis, tum ante editum à me indicem ſupellectilis, tum poſt.

"Non ſcripſi, incidendam veſicam à latere proſtatæ, quod Sharp de me tradit; non plagam veſicæ ſupra proſtatam infligendam, quod Camperus; ad quem certe locum cathetere Rauïi perveniri nequit, ut profecto non mirer facere non potuiſſe, qui ſic intellexerint: ſed ſcripſi, veſicam proxime cervicem ejus, ſive collum à latere, nonnihil inferiora et poſteriora verſùs, incidere propoſuiſſe, ubi certe proſtata incidenda eſt." *Albini Annotationes.*

‡ "Tous les chirurgiens qui ont fait la même tentative avec la ſonde, n'ont pû, non plus que moi, *parvenir à couper le corps de la veſſie ſimplement, d'où l'on a jugé que M. Albinus n'a pas bien compris la méthode de M. Raw;* car il

to refute, the charge of ignorance and imprudence, and moſt willingly would he have wiped off the reproach. But here, in his eagerneſs to exculpate himſelf from the charge, he mentions one proof which Camper directly and flatly contradicts. "Never, (ſays Camper,) while I was the pupil of Albinus, did he demonſtrate the parts wounded in this operation! Every year he performed on the dead body, and explained to his diſſecting pupils the operation of Raw, but, without demonſtrating the parts, or even opening the bladder from the ſide of the abdomen. Nor could I, from his inſtructions, form the ſlighteſt opinion on this point of ſuch high importance to humanity *."

Thus did Albinus, in his latter years, ſtrive to ſave his reputation from this notorious blunder; he tried by implication, and circumſtantial proof, to take off the force of words too plain to be miſunderſtood, and too deliberately pronounced to be recalled in any other way than by an open ingenuous avowal of his fault. His words made unhappily this uniform impreſſion on the minds of ſurgeons in all parts of Europe, that Raw did cut the body only of the bladder, behind the gland; it was known to Albinus, for many years, that on the ſole authority of his deſcription, this was univerſally believed †: "He acknowledges that he underſtood it to be the *deſign* of Raw to cut boldly into the body of the bladder, near the neck;" whether Raw was or was not able to accompliſh this deſign, whether he could open the body without in ſome degree touching the neck of the bladder, is a diſpute unworthy of a man of honour. Raw deſigned to open the body of the bladder, and all the ſurgeons of Europe endeavoured to follow his example; their career was interrupted only by the difficulties of that deep inciſion, by the dangers of it,

ne paroît pas poſſible que ce chirurgien conduit par la ſonde, ait pû éviter de faire du moins ſon inciſion en partie au col de la veſſie; ce qui eſt conforme à ce que M. Raw a dit lui-même pluſieurs fois lorſqu'on l'interrogeoit ſur les parties qu'il coupoit dans ſon opération: liſez Celſe, c'eſt tout ce qu'il répondoit." *Foubert*, page 663.

* "Albinus nunquam quo tempore ejus auditor fui, licèt quotannis lateralem Rauïi methodum in privatis ſcholis demonſtraret, atque in cadavere inſtitueret anatomen partium inciſarum, auditoribus ſuis oſtendit, veſicam ne quidem a parte abdominis aperiebat: nihil certi itaque, quod ad rem tanti momenti, humano generi adeo utilem ſpectabat, ex ejus inſtitutionibus determinare potui." *Camper*, page 14.

† The very title of Douglas's book implies the opinion of the profeſſion; his is "A HISTORY OF THE LATERAL OPERATION, or an account of the method of extracting a ſtone by *making a wound near the great protuberance* of the os iſchium, through the common integuments and levator-ani, into the ſide of the bladder, *without touching the urethra, proſtate gland, veſiculæ ſeminales*, or every other of the urinary or ſeminal veſſels, firſt attempted by Frere Jaques, in France, and afterwards ſucceſsfully performed by *profeſſor Raw*, in Holland, anno 1726."

and (melancholy to relate!) by the death of numbers of their patients. The reſult of Cheſſelden's experiments has been already explained: what may have happened in the practice of others leſs dextrous and leſs ingenuous, we do not know; but it is greatly to be feared that innumerable deaths are to be aſcribed to the precipitancy and vanity of Albinus, and to the mean and ſordid temper of Raw.

THE

OPERATION OF LITHOTOMY.

SECTION III.

Containing the Hiſtory of the Lateral Operation, Proofs of its Excellency, and plain Inſtructions for performing the Operation with the Knife or with the Gorget.

OF THE LATERAL LITHOTOMY INVENTED BY THE ENGLISH SURGEONS, AND NOW PRACTISED ALL OVER EUROPE.

It is gratifying to recollect that in our own country, England, there have not been wanting men, ſkilful in ſurgery and anatomy, who have improved this particular operation to the higheſt point, ſo that it is univerſally known among foreigners under the title of the Lateral Lithotomy, or Operation of the Engliſh ſurgeons. Of the ſcience and ſkill of thoſe Engliſh ſurgeons, we have reaſon to be proud, and ſtill more of their open, manly, and ingenuous manners; for, with the worſt examples before them, they acted the moſt generous part, not only diſcloſing their operation, but teaching it moſt aſſiduouſly to ſtrangers.

No ſooner was the biography of Raw publiſhed by Albinus, than it excited univerſal ſatisfaction to find, that an operation which was ſuppoſed to have died with its inventor, was ſo plainly deſcribed. This memoir found commentators in all countries; in England, the ſurgeons, eſpecially of the great hoſpitals, St. Bartholomew's, and Guy's, took a moſt particular intereſt in it. Douglaſs was the hiſtorian of what was doing among our neighbours, and preſented to the Royal So-

ciety a memoir, containing tranſlations of this piece of Albinus, and he produced at the ſame time a ſyſtem of diſſections to ſupport his reaſoning. "As ſoon," ſays Douglaſs, "as the book of Albinus was publiſhed at Leyden, he did me the honour, amongſt ſeveral of his ingenious friends here in London, to ſend it me in a preſent; and at the next meeting of the Royal Society, I thought proper to lay before them an abſtract, in Engliſh, of that part of it which relates to Mr. Raw's operation for the ſtone, together with ſeveral preparations, from which I demonſtrated and deſcribed the parts concerned in it *. So natural is the deſire of claiming inventions already announced to the public, that Douglaſs could not refrain from an attempt of this kind. "Of the ſeveral ways (ſays Douglaſs) of getting into the human bladder, I always reckoned that practiſed by profeſſor Raw to be one, long before I had heard any thing of his true method, or even of that of Frere Jaques;" and he adds, with exultation, that, "by his early tranſlation of Albinus, he had inſpired the ſurgeons of England with the deſire of rivalling the lithotomiſts of other countries †."

In the great hoſpitals of London, the high operation had hitherto been performed, when Bamber, in St. Bartholomew's, and Cheſſelden, in Guy's and St. Thomas's hoſpitals, adventured to perform his new operation, "each in the way that beſt ſuited his genius." Bamber ſervilely adhered to the text of Albinus; "he thought it proper to follow every ſtep of Raw's method, except that he filled the bladder moderately with water ‡;" while Cheſſelden, with a bolder hand and more adventurous ſpirit, ſought out a ſafer way of performing the inciſion.

* He goes on to ſay, "Theſe preparations I have had a good many years by me; they make part of a complete collection that I have made, by which all the poſſible ways of getting into the human bladder in order to extract the ſtone may, with the greateſt clearneſs, be illuſtrated, even the advantages and inconveniences of each of them, as far as they depend upon the ſtructure of the parts, with the greateſt certainty determined. *Of theſe ways I always reckoned that practiſed by profeſſor Raw to be one long before I had heard any thing of his true method," or even of that of Frere Jaques.* Douglaſs, page 81.

† "If I may judge by the event, what I then offered to the Royal Society was, by many members of that honourable body, thought no unſuitable entertainment for them; for, from that time, ſeveral worthy phyſicians and ſurgeons having carefully read Albinus's book, and examined my preparations, began to think ſeriouſly of introducing the practice of it among us. And I moſt willingly embrace this opportunity of doing juſtice to the ingenious Dr. Bamber, and Mr. Cheſſelden, by declaring, in a public manner, (what I had many opportunities of knowing, having aſſiſted at moſt of the experiments they made on dead bodies,) that, as it was their turn to cut in the two great hoſpitals of this city the following ſeaſon, I beheld with the utmoſt pleaſure the alacrity, induſtry, and application, with which they ſoon made themſelves maſters of this operation, *each in the way that ſuited his genius beſt.*" Douglaſs, page 82.

‡ Douglaſs.

It was believed that, if the inciſion was made into the body of the bladder, the neck and proſtate being ſpared, no fiſtula could enſue; and it was rumoured that Raw knew how to perform this diſſection, and that it was to this peculiar method he owed all his ſucceſs. Cheſſelden had no information concerning Raw's method, but what tended to deceive him: he cut, according to this theory, deep into the body of the bladder, and his patients expired in great tortures: he was then conſcious that the very form of inciſion which was deſigned to prevent fiſtulas, was actually the cauſe both of fiſtulas, and of ſtill more imminent dangers; and then it was that, reſolving to judge for himſelf, he invented that operation which has been named the Lateral Operation ever ſince. "Upon theſe diſappointments (ſays Cheſſelden) I contrived the manner of cutting, which is now called the lateral way *."

In no long time the lateral operation of Cheſſelden became as famous as the operation of Raw or Frere Jaques. Morand, then the moſt celebrated ſurgeon in France, was ſtruck with a great deſire of viſiting England; and he came to this country not as an individual zealous in his profeſſion, and willing to receive the inſtructions of the firſt lithotomiſt in Europe, but as the accredited envoy of the royal academy of France. "Hearing (ſays Morand) of the great ſucceſs of this operation, I propoſed to the Royal Academy of Sciences to take the journey, in order to witneſs the operations of this lithotomiſt; and ſo highly were the members pleaſed with my deſign, that it was agreed that I ſhould travel at the public expence." The opportunities I had, in the year 1729, of ſeeing this operation in St. Thomas's hoſpital, the queſtions I put to the patients of Cheſſelden, and the converſations I had with the operator himſelf, gave me conceptions which ſpeculation alone never could have enabled me to attain. I reſolved therefore to attempt the operation, which, though I believed more difficult than that by the apparatus major, I found infinitely more eaſy."

A ſurgeon of this country muſt read the encomiums of Morand with particular pleaſure: "Cheſſelden (ſays he), after having overcome, by an effort of his mind, and for the good of his fellow-creatures, a natural repugnance to operations, performed this in particular with admirable coolneſs and ſurpriſing rapidity; I have often ſeen him extract the ſtone in twenty-four ſeconds, and indeed he ſeldom took more than one minute in ordinary caſes, where there was but a ſingle ſtone. He cut, while I was in London, twenty-ſeven patients without loſing one; the

* Anatomy, page 330.

twenty-eighth died; but even before this man died he had cut thirty-one patients: he had in three years cut ninety patients with unparalleled ſucceſs."

Morand returned to his own country, and all the ſurgeons of France were impatient to learn the reſult of his miſſion; among theſe Garengeot bore the ſuſpenſe with the worſt grace. He declaimed againſt Morand, Cheſſelden, and all the world; and as they declined inſtructing him in this new manner of operating, he took the privilege of ſaying that he had, by his natural ingenuity and diligent experiments, diſcovered the true operation himſelf. Douglas had affected to diſcover, unaſſiſted, the operation of Frere Jaques; Garengeot, in like manner, affected to have anticipated (yet it was only by two days) the diſcovery of Cheſſelden's operation. "We hoped (ſays he) to have our doubts reſolved by Mr. Morand, and to learn from him, by example, to perform the operation of Cheſſelden; but the happineſs of ſeeing him operate on the dead ſubject was reſerved for a few as diſcreet and ſilent as himſelf. We neglected not, in the mean time, to apply to ſome of our friends who were intimate with Cheſſelden for the needful information; but this celebrated ſurgeon only replied, that, having concealed nothing from Morand, and having even explained his operation in writing, he could ſay nothing, neither to friends nor ſtrangers, which might anticipate the memoir which Mr. Morand was preparing to preſent to the Academy *."

Thus it would appear that Morand had regarded this *confrère* of his as a buſy, meddling, reſtleſs creature, and treated his petulance with ſomething like contempt;

* "Auſſi-tôt que M. Morand fut de retour à Paris, nous crumes pouvoir verifier nos experiences, et apprendre de lui la méthode de M. Cheſelden; mais le plaiſir de le voir opérer ſur des cadavres fut reſervé à trois ou quatre perſonnes auſſi diſcretes que lui.

"Nous eumes dans ce contre-tems recours à quelques-uns de nos amis qui étoient en relation avec M. Cheſelden. Cet habile chirurgien leur repondit, qu'il lui avoit même envoyé ſa méthode par écrit, et qu'il ne pouvoit inſtruire ni compatriotes ni étrangers, que M. Morand n'eut donné à l'Academie des Sciences un mémoire de ce qu'il lui avoit envoyé.

"Mais DEUX JOURS APRES, je veux dire le 13 Mai 1730, tous nos doutes furent levés en voiant opérer M. Morand dans l'Hôpital de la Charité. Ce fut-là que nous reconnumes avec un vrai plaiſir *que notre travail et nos ſeules médiations nous avoient fait decouvrir la méthode de cet opérateur Anglois*, on pour mieux dire, la méthode de Frère Jaques exécutée avec plus de diſcernement. Toute la différence que nous remarquames entre la manœuvre de M. Morand et l'écrit que nous avions publié deux mois auparavant, eſt que ce chirurgien *ne retourna point le poignet, ni par conſequent le biſtouri pour entrer dans la veſſie.* Nous avons fait ſentir que notre méthode n'en cedoit en rien à celle-ci; c'eſt donc de ce que nous en avons dit qu'il faut tirer toutes les reflexions."

and that Cheſſelden had, on his part, acted with good faith to his friend Morand; but far from concealing an operation learnt at ſo much expence, and ſo intereſting to humanity, Morand made it public without loſs of time, and gave the lie to Garengeot, by teaching it aſſiduouſly to all his pupils; and almoſt all the younger ſurgeons in the cities and provinces of France had been his pupils. He particularly taught Le Cat, and held the ſtaff for him in his firſt operations, and he gives us a long liſt of the lithotomiſts who practiſed Cheſſelden's operation, and their various ſucceſſes. Mr. Dent, the ſurgeon in Dublin, was of the number of thoſe pupils, and had performed the operation upon twenty-three patients, of whom twenty-one ſurvived. The liſt of operations performed in Rochfort, Beſançon, Cadiz, Perpignan, Utrecht, Montpellier, Bruſſels, Bergen-op-Zoom, and other cities, proved that, of thirty or forty cut for the ſtone, no more than three or four died; at Bergen-op-Zoom, thirty were cut for the ſtone, of whom not one died *.

Thus was the lateral method, or the operation of the Engliſh ſurgeons, introduced into foreign countries, in a manner peculiarly honourable to the inventor; and abroad, as well as at home, the operation of Cheſſelden has been invariably preferred to all others, though it has been performed in a variety of ways. "In all the cities of France, (ſays Morand,) the ſurgeons practiſe Cheſſelden's operation; ſome with a knife like Cheſſelden's, ſome with the lithotome caché of Frere Côme; ſome with one inſtrument, others with another: but all practiſe his method in preference to the old."—"But Cheſſelden, truſting entirely to his knowledge of the parts, cut ſimply with the knife and ſtaff, and it is peculiarly intereſting to obſerve the ſeveral changes of his operation, and the motives which induced him to change. That we may at once have under review all the various ſtages of improvement, I ſhall analyſe, in diſtinct order, the ſeveral variations in the lateral operation, deducing it from the rude inciſion of Frere Jaques.

* Garengeot ſays; "Il eut été à ſouhaiter pour y réüſſir, de pouvoir tirer quelque éclairciſſement de M. Cheſelden lui-même, ou de quelque perſonne entenduë qui eut fait un récit de ſa méthode, et l'eut exécutée ſur quelques cadavres. *Mais le miſtère des uns et des autres* eſt ſi grand, *que juſqu'ici ni compatriotes ni étrangers* n'en ont pû rien apprendre."

This paragraph is a groſs and palpable falſehood, it is directly aimed at Cheſſelden and Morand; the one moſt liberally inclined and actually employed in teaching his operation, and practiſing it openly; the other induſtriouſly employed in learning, with the deſign of teaching it in France. Morand being the deputy of a public body was in no ſhape amenable to Garengeot; and this paragraph was written in mere bitterneſs of ſpirit, when he found he had no opportunity of anticipating Morand. "This gentleman (ſays Morand) has a ſingular paſſion for writing on every thing, and before every body."

1ſt, Frere Jaques, rude and unſkilled in anatomy, ſtruck his knife into the hip, aimed at the body of the bladder, and generally reached the body of the bladder at that part which lies behind the proſtate. He was dextrous only in extracting ſtone: his operations were generally unſucceſsful: the good he did the profeſſion was, the proving that it was ſafe to cut, with the knife, thoſe parts which hitherto they had ventured only to dilate with the inſtruments of the apparatus major.

2d, When Frere Jaques had been taught, by Fagon and Felix, to reform his operation; in place of ſtriking his dagger-ſhaped knife thus all at once deep among the parts, he cut upon a grooved ſtaff, made his outward inciſions as we do, not by ſtriking the knife like a poniard into the hip, but by ſucceſſive longitudinal inciſions, and made his inward inciſion by cutting the proſtate gland and neck of the bladder upon the groove of the ſtaff.

3dly, Raw, ſkilful in anatomy, dextrous in ſurgery, and diligent in remarking the operations of Frere Jaques, learned from him, when he firſt appeared in Amſterdam, this operation of cutting behind the gland; and then it was proclaimed as the true theory of lithotomy, that, by cutting in the body of the bladder and ſparing the gland and the ſphincter veſicæ, no fiſtula nor incontinence of urine could happen, ſince thoſe important parts were left entire: to cut thus into the body of the bladder, behind the gland, was thought the moſt ſcientific and the moſt certainly ſucceſsful inciſion.

4thly, Raw could not long miſtake the principles of the operation; he muſt ſoon have diſcovered that an inciſion, thus deep among the cellular ſubſtance ſurrounding the rectum, an inciſion ſo oblique in which the external was ſo ill oppoſed to the internal wound, could not prevent fiſtulas, but muſt rather cauſe them; he accordingly diſcovered, by his own natural ingenuity, the danger of cutting into the body of the bladder; and by ſeeing Frere Jaques, upon his return to Holland, perform his new and more ſcientific operation taught him by Fagon, he was confirmed in his reaſonings: then his ſplendid ſucceſſes began; for then he cut, like Frere Jaques, the proſtate gland and neck of the bladder, upon a grooved ſtaff; but he put ſtill his finger on his lips, and when queſtioned by his pupils about the preciſe place and effect of this inciſion, he refuſed to anſwer, or only replied, "Legite Celſum." He thought his reputation at ſtake, and, though it was manifeſtly important to the profeſſion and to humanity, that he ſhould make known his true operation, he was ſo diſingenuous as to leave the world under the continued impreſſion

that the wound he made was ſtill in the body of the bladder! His ſecret went with him to the grave.

5thly, When Cheſſelden, diſſatisfied with the high operation which had hitherto been performed in the London hoſpitals, reſolved to imitate the operations of Frere Jaques and Raw; he had no guide but the deſcriptions of Albinus, who, though long the aſſiſtant of Raw, was himſelf deceived. The general perſuaſion was, that Raw had cut into the body of the bladder, behind the gland; and that his leaving the proſtate gland, the neck of the bladder, and the ſphincter entire, was the cauſe of his ſucceſs. An anatomiſt ſo ſkilful and enterpriſing as Cheſſelden could find no difficulty in making this deep inciſion, holding down the gut with his finger, and diſſecting till he came to the body of the bladder; he practiſed this method for a little while, but, in place of the ſplendid ſucceſſes of Raw, he found nothing but diſappointment, four patients, out of ten, died, and in the moſt miſerable manner. This was his operation in the year 1726 *.

* Douglas, the firſt who reviewed the biographical ſketch by Albinus; the firſt who tranſlated and commented upon it; the firſt who directed the attention of the Engliſh ſurgeons to the operation of Raw; the firſt who made ſyſtematic diſſections of the parts, was eager to claim theſe honours; he laid claim even to the diſcovery of Raw. Douglas, while he was buſy with theſe diſſections and tranſlations, was in haſte to explain the operation of Cheſſelden, before he underſtood it, and to claim peculiar honours for that operator, before his operation differed in the ſlighteſt degree from the firſt and worſt method of Frere Jaques. Douglas's hiſtory of Cheſſelden's operations in the year 1726 is this: "I have already mentioned an account of Raw's method given by Mr. Cheſſelden, in the 'Preface to his Treatiſe on the High Operation for the Stone,' publiſhed 1723, as he had received it from thoſe who had been ſcholars to Mr. Raw, and ſeveral times preſent at his operations. His informations were indeed very lame and imperfect, but yet, *even from theſe he had conceived ſo favourable an idea of that method, as to think it preferable either to that of Celſus or Marianus;* and withal that it would be ſtill more ſo, if the bladder was firſt filled with water."

"Albinus's late Treatiſe has, as I have already remarked, given this ingenious and moſt expert ſurgeon an opportunity of examining the whole matter with more clearneſs and certainty than he had done before; and the fruit of the pains he has been at, is not only to confirm him in his former favourable opinion of it, but alſo to bring it to ſuch a degree of perfection, as in his judgment makes it preferable to all the methods of cutting that have ever been invented."

"The patient being brought from his bed in a night gown, and ſituated in this manner, the operator thruſt an hollow grooved ſteel catheter through the urethra into the bladder, and with a ſyringe, mounted with an ox's ureter, injects as much warm water into it as the patient can bear without pain, in the ſame manner as is done in the high operation. Into one patient of about eighteen years of age, and who had a ſtone weighing ſix ounces and a quarter, Mr. Cheſſelden injected ſeven ounces of water; but he thinks the quantity may always be determined by the complaints of the patient, without obſerving any other rule."

"When the water is injected, and ſecured from running out, by tying round the penis a narrow ſlip of flannel, he gives the end of the catheter to an intelligent aſſiſtant to hold, whoſe principal care is to keep it from

6thly, Senſible that the ſufferings and death of his patients proceeded from theſe deep inciſions, Cheſſelden truſted no longer to the reports concerning Raw's operation, but to his own genius, and appealed from the authority of Albinus to the anatomy of the parts. He reſolved to cut no more by the ſide of the rectum ſo deep, but to cut, in place of the body of the bladder, the neck only, and the proſtate gland which ſurrounds it: The ſeveral ways in which he at various times performed this operation, the true lateral lithotomy, are extremely intereſting.

Firſt, after having forſaken the operation of Raw, when he firſt adventured on that operation (the ſlitting up the ſide of the proſtate gland), which was afterwards called the lateral method, he, after a free external inciſion, in which he cut betwixt the accelerator and erector muſcles, introduced two fingers to feel for the ſtaff, and hold down the gut; and, ſeeking out the membranous part of the urethra, he cut up that part of it and the ſide of the proſtate*. This was

riſing, but not at all to direct the groove to the place where the inciſion is to be made, for a reaſon that we ſhall hear preſently."

"Then the operator, having ſeated himſelf upon a chair, the height of which is ſuitable to that of the table on which the patient is laid, takes a pointed knife with a convex edge, and *beginning about an inch above the anus on the left ſide of the rapha, between the* accelerator urinæ, or, as I name that muſcle, conſtrictor urethræ, and the erector penis, he makes an inciſion *downwards, by the ſide of the ſphincter ani, a little obliquely outwards, as it deſcends from two and an half to four inches in length*, according to the age of the patient or ſize and ſtructure of the parts. This firſt inciſion he endeavours to make all at one ſtroke, ſo as to cut through the ſkin, fat and all, or part of the levator-ani, which lies in his way."

"As ſoon as this is done, he thruſts the forefinger of his left hand into the middle of the wound, in order to preſs the inteſtinum rectum to one ſide, that it may be in leſs danger of being cut, *and, taking a crooked knife in his other hand, with the edge on the concave ſide, he thruſts the point of it through the wound, cloſe by his finger, into the bladder, between the veſicula ſeminalis and os iſchium of the ſame ſide;* then, lowering his hand, he continues this ſecond inciſion upwards till the point of his knife comes out at the upper part of the firſt."

"This is Mr. Cheſſelden's regular method of cutting, and when no accident happens, which it was impoſſible to be aware of before the operation, he has been ſeldom above a minute (ſometimes leſs) between the beginning of the firſt inciſion and extraction of the ſtone." Douglas on Lithotomy.

At this time then it would appear that Cheſſelden had not yet invented the lateral operation, and was but occupied in imitating the operation of Raw, with no other difference than that of diſtending the bladder with tepid water.

* "This operation I do in the following manner: I tie the patient, as for the great apparatus, but lay him upon a blanket ſeveral times double, upon an horizontal table three feet high, with his head only raiſed; I firſt make *as long an inciſion* as I can, beginning near the place where the old operation ends, and cutting down between the muſculous accelerator urinæ, and erector penis, and by the ſide of the inteſtinum rectum. I then feel for the *ſtaff*, holding the gut all the while with one or two fingers of the left hand, and cut upon it

the operation deſcribed by Cheſſelden in the Appendix to his Anatomy; the operation which he taught to Morand, who merely tranſlates the words of Cheſſelden: "Je continue de couper de haut en bas entre les muſcles accelerateur de l'urine et l'erecteur de la verge et à coté de l'inteſtine rectum. Je tâte enſuite pour trouver *le ſonde, et je* coupe *la deſſus le long de la gland proſtate, continuant juſqu' à la veſſie*, en aſſujetiſſant le rectum en bas pendant tout le tems de l'opération avec une ou deux doigts de la maine gauche *." Whatever the private inſtructions were which Morand received from the Engliſh lithotomiſts, they could not be ſuch as to alter the deſign of the operation, which plainly conſiſted, according to the expreſs words both of the maſter and of the pupil, in running the knife downwards and backwards through the thick ſubſtance of the proſtate gland along the groove of the ſtaff. It is very remarkable, that, having taught Morand this operation, Cheſſelden commends it to his particular protection, ſaying (in one of his private letters, after Morand's return to his native country,) "that operation which I taught you, I am ſure I never ſhall have reaſon to change;" and yet this favoured operation he did change, and that in the next ſeaſon for cutting for the ſtone! It was in the year 1731, the very year after Morand's return to France, that Cheſſelden forſook his firſt and approved operation, becauſe all his care in keeping the rectum out of the way of the knife was of no avail; he ingenuouſly confeſſed to Morand, that, in running the knife backwards along the groove of the ſtaff, he had twice wounded the rectum; there is reaſon to believe that, while he felt the difficulty of making this inciſion ſafely, he was conſcious that the inciſion of the gland was often too ſmall for the free tranſmiſſion of the ſtone.

Secondly, Cheſſelden, reduced to the neceſſity of abandoning not the principles of the operation but the manner in which it was performed, continued to cut the ſame parts, viz. the membranous part of the urethra, and the proſtate gland; but he cut them by moving his knife in a direction oppoſite to that of his firſt inciſion, i. e. from behind, forwards; his inciſion ending now, where, in his former operations, it had begun. The proofs of this mode of inciſion are alſo intereſting, and I ſhall deliver them. It is in a ſecond hiſtory of the operation by Douglas, dated Covent Garden 1731, that we find the true operation of Cheſſel-

in that *part of the urethra which lies beyond the corpora cavernoſa urethræ, and in the proſtate gland*, cutting from below upwards to avoid the gut." Cheſſelden's Anatomy. Appendix on cutting for the ſtone, anno 1730.

* Morand, page 116.

den deſcribed *. He had felt the difficulty of making a ſufficient inciſion of the proſtate; he had experienced the dangers of wounding the rectum in cutting from the membranous part of the urethra backwards to the body of the bladder; and he reſolved now to diſſect till he reached the body of the bladder and felt the ſtaff behind the gland, and to open the whole length of the gland, by drawing the knife towards him along the groove of the ſtaff.

" In performing the lateral operation, he makes the firſt or outward inciſion, (ſays Douglas,) through the integuments, from above downwards, beginning on the left ſide of the raphe or ſeam betwixt the ſcrotum, and the verge of the anus, almoſt as high up as where the ſkin of the perinæum begins to dilate and form the bag that contains the teſticles, and from thence he continues the wound obliquely outwards, as low down as the middle of the margin of the anus, at about half an inch diſtant from it, near the ſkin, and conſequently beyond the great protuberance of the os iſchium.

" The firſt, or upper part of this inciſion is cut ſuperficial; after that, he *plunges his knife much deeper by the ſide of the rectum, and finiſhes it by drawing his knife obliquely towards himſelf.* Theſe three motions may always be obſerved in his external inciſion, but the laſt is performed pretty much at random; his knife firſt enters the groove of the *roſtrated or ſtraight part* of the catheter, *through the ſide of the bladder immediately above the proſtate;* and afterwards, the point of it continuing to run in the ſame groove in a direction downwards and forwards, or towards himſelf, he divides that part of the ſphincter of the bladder that lies upon the gland; and then he cuts the outſide of one half of it obliquely, according to the direction of the whole length of the urethra that runs within it, and finiſhes his internal inciſion by dividing the muſcular portion of the urethra on the convex part of the ſtaff.

" When he firſt began to practiſe this method *he cut the very ſame* parts *the contrary way*, that is, his knife firſt entered the muſcular part of the urethra, which he divided laterally from the pendulous part of its bulb, to the apex of the proſtate gland; and from thence directed his knife upwards and backwards, all the way into the bladder, as we may read in the appendix he lately publiſhed to the fourth

* Douglas, in his introduction to the Hiſtory of the New Operation of Cheſſelden, ſays, " Since the time of my firſt publication, viz. that in 1726, Mr. Cheſſelden has, for very good reaſons, laid this method aſide and ſubſtituted another very different in its room, which he now practiſes with great applauſe and vaſt ſucceſs, having ſaved fifty patients out of fifty-two."

edition of his book of Anatomy. But ſome time afterwards he obſerved that in that manner of cutting, the bulb of the urethra lay too much in the way, the groove of the ſtaff was not ſo eaſily found, and the inteſtinum rectum was in more danger of being wounded." Douglas.

Cheſſelden, with all the enthuſiaſm of an inventor, believed that he had diſcovered an operation which was not ſuſceptible of improvement; yet he himſelf changed the form or manner of his inciſion no leſs than three times in the courſe of a few years. 1ſt, He cut into the body of the bladder behind the proſtate, when he imitated Raw; 2dly, he cut another part of the bladder viz. the neck and the thick ſubſtance of the proſtate; this is his lateral mode of inciſion; 3dly, he changed a third time, not the eſſential form of the inciſion, but the direction in which he moved the knife; for in his *firſt operation*, when imitating the ſuppoſed operation of Raw and Frere Jaques, he ſtruck his knife into the body of the bladder, betwixt the tuber iſchii and the veſiculæ ſeminales, and all his inciſion lay behind the proſtate gland: in his *ſecond operation* he ſtruck his knife into the membranous part of the urethra, immediately behind the bulb, and ran it down through the ſubſtance of the gland; but his inciſion ſtopped at the membranous part or body of the bladder: but in his *third operation*, he, after very large external inciſions, ſtruck his knife deep into the great hollow under the tuber iſchii, entered it into the body of the bladder immediately behind the gland, and, drawing the knife towards him, cut through the whole ſubſtance of the gland, and even a part of the urethra, "cutting the ſame parts the contrary way." By carrying the forefinger of the left hand before the knife in diſſecting towards the body of the bladder, he protected the rectum more perfectly than he could do in running the knife backwards along the groove of the ſtaff; and, by ſtriking his knife into the body of the bladder, and drawing it towards him through the whole thickneſs of the gland, he was ſure to make an ample wound.

But when he learned thus to plunge his knife thus deep into the hollow under the tuber iſchii, and puſh it into the body of the bladder behind the proſtate gland, and to make his internal inciſion by drawing the knife towards himſelf, one would imagine he were performing the very operation with the ſucceſs of which he had been ſo ill ſatisfied! By no means! The firſt and the laſt of his operations were eſſentially different; in his firſt operation he ſtruck the knife, in imitation of Frere Jaques and Raw, into the bladder, betwixt the veſiculæ ſeminales and tuber iſchii; he ſtopped at the back part of the gland; all his inciſion lay behind the gland; *he cut the body*

Plans of Cheſeldon's Lithotomy.

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Fig. 1st

Fig. 2nd

Fig. 5th

Fig. 3d

Fig. 4th

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Engraved by W. Skelton

of the bladder only: but in his laſt operation, which all ſucceeding lithotomiſts have approved and practiſed, he cut no part of the body of the bladder; he entered his knife cloſe behind the proſtate gland, and, in drawing it towards him, he of courſe *cut only the neck of the bladder where it is ſurrounded by the gland**.

And here let me once for all remark the difference betwixt the lithotomy of the French and of the Engliſh ſurgeons; for, while "they cut the ſame parts, they cut, them (to uſe once more the words of Douglas) the oppoſite way." The French cut, in imitation of Frere Jaques and Raw, from before, backwards; and differ in every circumſtance, in the poſture of the patient, in the form of the knife, and in the holding of the ſtaff, from the method of the Engliſh ſurgeons. The French ſurgeon kneels when operating, and his patient lies not horizontally, but reclining againſt the breaſt of an aſſiſtant. The French ſurgeon holds the ſtaff with the left hand, leſt the aſſiſtant ſhould diſplace it in the moſt critical moment of the operation; and in place of diſſecting gradually forwards, he, after the outward inciſion, plunges his knife into the hollow by the ſide of the rectum, and runs the point of the knife at the bent of the ſtaff. In place of uſing the common ſcalpell, the French ſurgeons have uſed a lithotome or knife, better accommodated to this mode of inciſion; it is conical, pointed, equally ſharp on both ſides, and reſembles an abſceſs-lancet, made faſt in its ſcales. The French operated in the following manner: The ſurgeon, holding the handle of the ſtaff in his left hand, uſed to feel with the foreſinger of the right for the bending of the ſtaff, where it lies in the perinæum, the knife being in the mean while held in the mouth; then, taking the lithotome in the right hand, he made the outward inciſion with the edge of the knife, drawing the knife along like a common ſcalpell; then, plunging the point into that part of the hollow where he had marked the catheter, he ran the point of the knife, as ſoon as it had encountered the naked part of the ſtaff, (viz. juſt behind the bulb,) onwards into the bladder, through the body of the proſtate gland. Such an inciſion as ſhall by-and-by be explained, while it made too ſmall an opening in the gland,

* That this was the operation performed by Cheſſelden, I have already ſufficiently proved;—that this operation was underſtood univerſally in other countries, my reader will be eaſily ſatisfied by the following quotation: "Demittitur autem ſcalpellum in vulneris angulum inferiorem, quò poſt proſtatam veſicam primùm intret. Hinc etenim incipiendo, plagam veſicæ tam verſùs bulbam urethræ ampliat; diſſectis, hoc opere, ſiniſtrâ portione glandulæ proſtatæ, colo veſicæ, et parte urethræ membranaceâ." Keſſelring de Method. Foubertianâ. —This is the deſcription of a gentleman who had been in London, and who had ſeen the lateral operation five times performed by Mr. Ghirle at St. Thomas's hoſpital, Cheſſelden himſelf being preſent.

could not be accompliſhed without great danger to the rectum, for this eſpecial reaſon, that the left hand of the operator, in place of being employed in guiding the inward inciſions and in preſſing the rectum out of the way of danger, was occupied in holding the ſtaff *.

The Engliſh ſurgeon uſually ſits at his operation; (but in this, I am a French Catholic, and would rather kneel †;) his patient lies quite horizontally, or even has his breech raiſed by a pillow, which better expoſes the perinæum and hip. Having once placed the ſtaff and felt for it in the perinæum, he delivers it to the aſſiſtant ſurgeon, who, by holding it, gives the lithotomiſt the uſe of both his hands. He cuts with the common ſcalpell, becauſe his purpoſe is, after the outward inciſion, to diſſect onwards through the cellular ſubſtance ſurrounding the rectum and bladder. After the great outward inciſion, which goes through the ſkin and cellular ſubſtance, he diſſects, by ſucceſſive ſtrokes, into the hollow under the tuber iſchii; preſſes the rectum out of the way of danger, with the fore and mid fingers of the left hand; and with the forefinger, particularly, he judges of what he is diſſecting, feels for the proſtate, and diſſects till he can diſtinguiſh the ſtaff behind the gland, through the thin walls of the bladder: he then, in place of endangering the rectum, turns the edge of the ſcalpell upwards away from the rectum, directs its edge fairly to the proſtate gland, and cuts the whole length of it upon the groove of the ſtaff. The French uſed a pointed knife, becauſe they performed the laſt and moſt critical part of the inciſion by a ſort of plunge, running the lithotome backwards into the bladder! The Engliſh uſe a common ſcalpell, and, in the moſt critical part of the operation, turn the back of the knife to the rectum, and the edge to the proſtate, which they divide by drawing the knife towards them along the groove of the ſtaff.

The cutting of the proſtate, then, is the eſſential part of the inward inciſion; the more completely the gland is divided, the more eaſy is the extraction of the

* "However, it muſt be confeſſed that this kind of knife ſeems beſt calculated for their manner of cutting, becauſe, inſtead of making three or four different inciſions down to the neck of the bladder, as we practiſe in England, they firſt divide the ſkin, and then *continue to puſh the knife forwards* without once withdrawing it till the inciſion is finiſhed." Sharp, page 220.

† Cheſſelden, or his pupil Sharp, who records theſe little peculiarities of the French and Engliſh operations, does not remark the cauſe of the difference of poſture, which is plainly this; that the poſture of the ſurgeon muſt be regulated by that of his patient; the eye muſt always be under the place of inciſion; if the patient lie inclined with his ſhoulders raiſed, as in France, the ſurgeon muſt kneel; if the patient be laid horizontally with his breech a little raiſed, as is the practice in England, the ſurgeon *may* ſit: but in either caſe I think it better to kneel.

ſtone; and as for the future conſequences of ſuch inciſion, or the healing of the wound, the ſuperiority of this mode of operating muſt be decided by comparing the form of the inciſion with the anatomy of the parts.—This compariſon of the forms of the inciſion with the parts to be divided is the laſt ſtep of that analytical proceſs by which I endeavour to inſtruct my reader, and to enable him to make his election: the ſuperiority of this operation will, I believe, be eaſily proved by very ſimple plans.

ANATOMICAL ANALYSIS OF THE OPERATIONS OF FRERE JAQUES, OF RAW, AND OF CHESSELDEN, BY WHOM THE LATERAL INCISION WAS INVENTED AND PERFECTED.

I have avowed it as my opinion, that, of all the operations of ſurgery, lithotomy is that in which the true principles of the operation may be moſt ſafely deduced from the anatomy of the parts. To conjecture *à priori*, which form of inciſion would be attended with feweſt dangers, would not be difficult; but now that we have before us ſuch a ſuite of experiments, performed in various countries by the greateſt maſters in ſurgery, and accompanied with ſuch authentic records of their various ſucceſſes, we are able, from experience as well as theory, to reſolve that important problem; "How we may, with leaſt danger, open our way into the bladder, for the extraction of the ſtone."

1ſt, There is no poſſibility of making a wound ſufficiently large for the exit of the ſtone, but by opening the great hollow by the ſide of the tuber iſchii, by cutting acroſs the tranſverſe muſcles, diſſecting deep among the cellular ſubſtance, and going right forward betwixt the rectum and the tuber iſchii, till we reach the bladder; in ſhort, there is no way of making a ſufficient opening for the exit of the ſtone, but by CUTTING UPON THE HIP: and I beg that my reader will carefully diſtinguiſh this from cutting upon the perinæum, as in the old operation of Marianus.

2dly, This hollow, where we ſeek for the bladder and proſtate gland, is filled with the looſeſt cellular ſubſtance, uniting the moſt membranous parts, viz. the coats of the bladder and rectum; and there is unfortunately ſo great a diſtance betwixt that part of the bladder which we aim at, and the external wound, that, cut how we will, the courſe of our wound muſt be more or leſs oblique, and an oblique wound among membranous and cellular parts is never void of danger.

3dly, When we aim at the body of the bladder behind the gland, we diſſect deep by the ſide of the rectum, and make a wound peculiarly oblique and unfavourable, from which the moſt melancholy ſymptoms enſue. Cheſſelden, for example, when he deſigned to imitate the ſuppoſed operation of Raw, preſſed the bladder low down with the ſtaff, and, having made his external inciſions, he ſtruck a long and crooked biſtoury into the body of the bladder, behind the gland. The wound being large and free, the extraction of the ſtone was not difficult: the patient ſlumbered out the two firſt days in perfect tranquillity and apparent ſafety; but, the cellular ſubſtance, in this long oblique wound, being infiltrated with urine, the parts never healed but ſuppurated, waſted, became fiſtulous, while ſometimes the peritoneum alſo partook of the inflammation, the abdomen was affected, and the patient expired in torments.

4thly, When, in place of aiming at this deep-lying part of the bladder, we aim only at the proſtate; when we open, by inciſion, the gland itſelf and the neck of the bladder, which the gland ſurrounds, we make the moſt favourable wound; then, in place of an oblique and deep inciſion, in which the external opening is at the greateſt poſſible diſtance from that in the bladder, we have an inciſion comparatively ſuperficial, in which the internal is nearly oppoſite to the external wound: in place of cutting into the thinneſt and moſt membranous part of the bladder, ſurrounded only by the looſe cellular ſubſtance, our inciſion paſſes through the thick and firm body of the proſtate gland, which, as it ſurrounds the cut part of the cervix, cloſes the inciſion by its ſwelling, puts the wounded ſurfaces in mutual contact, and affords, by its fleſhineſs, a ſubſtantial granulation for the healing of the wound. This ſwelling of the gland, which ultimately conduces ſo much to the cure, often cloſes the neck of the bladder ſo ſuddenly, that the patient begins to paſs his urine by the penis, even on the ſecond or third day after the operation.

Theſe general principles are admirably illuſtrated by the experiments and actual ſucceſſes of Cheſſelden, Raw, and Frere Jaques; and I hope to make the facts palpable and manifeſt by a few ſimple plans of the parts.

Figure 1. Is a plan expreſſing the courſe of the inciſion practiſed by Frere Jaques, before his operation was reformed, and by Cheſſelden too, in imitating the ſuppoſed operations of Frere Jaques and of Raw: (a) deſignates the length and place of the wound which is upon the point or apex of the hip; and to diſtinguiſh the outward wound, a probe is paſſed through it; (b b) marks the oblique courſe of the diſſection by which the lithotomiſt reaches the body of the bladder behind the proſtate

gland, which is marked (c); the extent of the wound in the bladder itſelf is marked (d); and the whole, or nearly the whole, length of the wound lies behind the gland, for it is made in the great lateral bulging of the bladder, immediately above the ureter and veſicula ſeminalis.

The conſequences of ſuch an inciſion are expreſſed in figure 2.; the ulcerated condition of the parts, on the third or fifth day, is here repreſented, and the reader is reminded of all the ill conſequences! firſt, of the diſtance betwixt (a) the external and (b) the internal wound, which is ſuch that the exit of the urine is difficult and ſlow, and its infiltration among the cellular ſubſtance almoſt inevitable! ſecondly, of the circumſtance the moſt approved by theoriſts, but really the moſt dangerous, viz. the proſtate gland being left entire; for the effect of the proſtate (c) being left entire and being inflamed and ſwelled is this, that not one particle of urine can paſs by the urethra, and every contraction of the bladder injects the cellular ſubſtance of the rectum with urine; thirdly, it is to be obſerved that the cellular ſubſtance, thus inflamed and ulcerated, is that which joins the membranous ſurfaces of the rectum and bladder; and that the thin edges of the cut bladder have ſo little ſubſtance, and are ſo little diſpoſed to granulate or heal, that urinous fiſtulas were frequent, and inflammation of the peritoneum and abdomen not uncommon, in the operations of Frere Jaques.

Figure 3. Is a diagram demonſtrating the excellency of that mode of inciſion which Cheſſelden practiſed from the time in which he began to think for himſelf; it is a ſcheme of the original lateral lithotomy of Cheſſelden which he performed with the knife. This is the very inciſion which has been practiſed by Frere Coſme, Le Cat, and others, who, though they have uſed knives of various ſhapes, have ſtill performed with them the ſame lateral lithotomy, and the ſame inciſion is made by the modern ſurgeon with the cutting gorget; it is an inciſion made into the neck of the bladder through the ſide of the proſtate gland, and named thence the lateral operation. Now this form of inciſion has theſe properties; firſt, the external wound is made, not entirely upon the hip at the greateſt poſſible diſtance from the bladder, but by the ſide of the anus (a), partly upon the perinæum, partly upon the hip, and directly over the ſpace occupied by the proſtate gland: ſecondly, the internal inciſion is made, not into the body of the bladder in the deepeſt part of the pelvis and at the greateſt diſtance from the external wound, but into the neck of the bladder at (b), through the body of the proſtate: thirdly, the plain deduction from this is, that neither in the time of operation is there the ſame immediate danger to the rectum, or to

the pudic artery, becauſe the lithotomiſt does not diſſect ſo deep, but cuts into the part of the bladder the moſt directly oppoſite to his external wound; nor, in the courſe of the cure, is there ſuch danger of fiſtulas or abdominal inflammation, for the plan proves that in this mode of inciſion the external and internal wounds are directly oppoſed to each other, and the courſe of the diſſection, not being ſo deep as in the other operations, is leſs oblique.

In figure 4., are more plainly expreſſed the excellencies and advantages of this inciſion; for, the whole length of the gland being cut, all formidable reſiſtance to the extraction of the ſtone is removed, and when the ſtone is extracted, the ſwelling of the bulky gland almoſt cloſes the wound; the urine begins to paſs by the urethra the ſecond or third day; and though, after the firſt ſwelling ſubſides, the urine paſſes again by the wound, yet, there being no opening in the membranous part of the bladder, the diſſection being neither deep nor oblique, the internal being directly oppoſed to the external wound, there is no infiltration of the urine into the cellular ſubſtance, and the gland, in granulating and healing, gives the internal wound the round form repreſented at (a), very different from that repreſented in fig. 2.

The diagram, No. 5., exhibits in epitome all theſe forms of inciſion, and illuſtrates in a particular manner the three ſucceſſive improvements of Cheſſelden's operation. His firſt error was in making his internal inciſion entirely behind the gland, from (a) to (b); his next improvement was to cut only through the body of the proſtate, to begin at the membranous part of the urethra, and ſtop at the back part of the gland, to cut, in ſhort, from (c) to (b); but ſoon finding that, by cutting in this direction, he could not make ſure of dividing the whole of the gland, and that by running his knife backwards he endangered the rectum and the pudic artery, he abandoned this method, and cut from behind forward, began his internal inciſion at (b) the poſterior part of the gland, and drew his knife forwards to (c) the beginning of the urethra; in performing this operation, he penetrated deep by diſſecting, ſtruck his knife into the bladder behind the gland, made his cut by drawing the knife towards him; "ending, in ſhort, this ſecond inciſion where the firſt began."

OF THE VARIOUS WAYS OF PERFORMING THE LATERAL OPERATION WITH THE TROCAR OF FOUBERT, THE KNIVES AND KISTOTOMES OF LE CAT, THE BISTOURI CACHÉE OF FRERE COSME, AND THE CUTTING GORGET OF SIR CÆSAR HAWKINS.

I have juſt reviewed the lives of thoſe eminent lithotomiſts from whoſe diſappointments, errors, and final improvements, I hope to draw the moſt uſeful leſſons: but, as ſkill in anatomy led to thoſe bold operations which were performed during laſt century, with ſuch memorable ſucceſs ignorance of anatomy has been the occaſion of ſurgeons, in latter times, ſeeking to avoid this curious, and, as they believe, dangerous diſſection with the knife, and of ſubſtituting in its place probe-pointed or beaked knives, which are conducted, by the help of grooved ſtaffs, through the neck of the bladder and proſtate gland.

Have we not reaſon to fear that our ſcience is on its decline, when, in place of cutting into the bladder boldly, the knife being guided by a knowledge of the parts, ſurgeons are willing to conduct their knife merely by running it along a grooved ſtaff? That ſuch a change implies a decline of ſcience and want of anatomical ſkill, is what I might perhaps be able to prove; but ſure I am, that I can demonſtrate dangers attending this blindfold ſtroke of the gorget, more truly terrible to a well inſtructed ſurgeon, than any accidental deviations of the knife: we cannot but remember how very much the reputation and actual performances of Cheſſelden and Raw have excelled the puny conceits and ſhort-lived fame of Le Cat, Frere Coſme, Hawkins, and other modern inventors. We cannot but lament, that the operation by which a ſurgeon can inſure ſucceſs proportioned to his ſkill and knowledge has fallen into diſuſe, while a rival operation, a blindfold ſtroke, the dangers of which are acknowledged even by thoſe who perform it, uſurps its place for no avowed reaſon, but that it can be as ſucceſsfully performed by the ignorant as by the ſkilful! Such mechanical contrivances would indeed be of ineſtimable value were it poſſible, in ſurgery, as in manufactures, to transfer the ſkill from the operator to the inventor, and to reduce the claſs of working-men from ſcientific operators to mere mechanics,—to men performing things which they do not comprehend, and contented with ſucceſs which they do not deſerve. Thus the

carver, or caſter in bronze, ſhapes a leaf with a ſingle ſtroke of a tool, which he never invented, or turns out from a die a bas-relief, which he has not even the ſentiment to admire, much leſs to model! by ſuch inventions have all the arts which are merely mechanical been facilitated and improved; but, ſuch a proceſs is too ſimple by far for the improvement of a ſcience which, in every particular act, requires intelligence and deſign.

The following queſtion, though of infinite importance to ſociety, far from being reſolved, has not even been propoſed:—"Is it ſafer to perform the operation of lithotomy with inſtruments ſo curiouſly adapted to each other by buttons and grooves, that the groove of the ſtaff may conduct the knife into the bladder without any nice regard to the ſize or conformation of the parts, juſt as a common directory guides a biſtoury?—or is it ſafer, to ſtudy the anatomy of the parts, to learn to diſſect them deliberately, and to cut the proſtate gland, not by a ſudden and blindfold puſh of the gorget or cutting director, but with the knife guided by the finger?" This queſtion will be eaſily reſolved, by reviewing the inventions of Le Cat, Frere Coſme, Foubert, and Hawkins; theſe were the firſt who deviated from the ſimple diſſection of Raw and Cheſſelden; they were the firſt inventors of grooved lithotomes, concealed knives, and cutting directors; their complicated and unhandy inſtruments exhibit a ſingular contraſt with the ſimple operations of Cheſſelden and Raw, and their achievements form a curious and inſtructive epiſode in the general hiſtory of lithotomy.

I am now entering upon a department of this ſubject peculiarly delicate, where, if I have an opinion different from that of the profeſſion, or think myſelf arrived at thoſe years of experience and knowledge, at the period of profeſſional reputation, which may enable me to form an opinion or entitle me to expreſs it freely, it becomes my peculiar duty to do ſo, however unfavourable that opinion may be to the operation now in common uſe. But whatever doubts I have concerning the ſuperiority of the modern operation ſhall be ſimply and honeſtly explained; nor will I allow myſelf to ſuppoſe that I can ſuffer the ſlighteſt blame for being true to my profeſſion, and diſcuſſing, with manly freedom, thoſe queſtions which are of univerſal concern, if only I diſcuſs them, as I proteſt I do, without ungenerous alluſions either to real misfortunes or to rumours of ill ſucceſs, without partiality or favour, or fear, or hatred of the living or the dead:—happily it is in my power to illuſtrate every axiom by reference to the ſchemes and practices of thoſe who are no longer ſenſible to praiſe or cenſure.

OF THE OPERATION OF M. LE CAT.

M. Le Cat, a ſurgeon of Rouen, in Normandy, is the gentleman whoſe orthodox faith and ſound ingenious comments on the aphoriſms of Hippocrates have been already celebrated; he was the firſt who formally and deliberately vindicated the principle of dilating the neck of the bladder with inſtruments, according to the analogy of the natural dilatation of the womb: he ſhowed ſtill greater ingenuity when he changed from his original practice of dilating the neck of the bladder, to the new operation of cutting the proſtate gland, without any apparent breach of principle, merely by the invention of a new term, by naming his inciſion of the proſtate "*Le debridement du col de la veſſie.*" When, at laſt, he was driven from ſuch evaſions, and forced to perform, along with all the profeſſion, the lateral inciſion of the proſtate; he operated with an apparatus ſo complicated, that to deſcribe his operation were very difficult, to perform it impoſſible; his reſtleſs genius for invention had ſuggeſted to him ſo many improvements, that he knew not himſelf, at any one period, with which of his knives he was operating *; his bag of inſtruments reſembled the confuſion of a lecturer's table, where ſpecimens of the idle inventions of various æras are tumbled in one heap; in all his theories and plans of operations, and in the groteſque ſhapes of his knives and conductors, there was an affectation of ſingularity, or rather a manifeſt depravity of judgment. When the ſimple operations of Raw and Cheſſelden were publicly promulgated, Le Cat, if he had been poſſeſſed of good ſenſe or ſound judgment, ſhould have been diſguſted with the puerile occupations of his former life! he ſhould have thrown aſide his complicated inſtruments, and applied himſelf, as he was an excellent anatomiſt, to learn the ſimple and manly operation of Cheſſelden with the knife and ſtaff! but it is a curious anecdote in ſurgery, it is mentioned with aſtoniſhment by Morand, and even by Le Cat himſelf it is acknowledged, that when Morand, juſt returned from England, taught him the operation, he would not perform it! For this he had not the apology of Garengeot: "Le myſterieuſe des étrangers et compatriotes." Morand put the ſmall lithotome or inciſion-knife of Cheſſelden into the hands of Le Cat, and held the ſtaff for him, and made him perform the operation, but he rejected the knife with the waywardneſs of a child, he ſought trivial apologies for

* "J'opérai *avec les trois eſpèces de mes inſtrumens*, le ciſtitome à tranchant diſcontinu, celui à tranchant continu, et le gorgeret-ciſtotome. Tous les reſultats furent exactement les mêmes."

not uſing it, and affected to prove that it was not fit for performing the inciſion of the proſtate *.

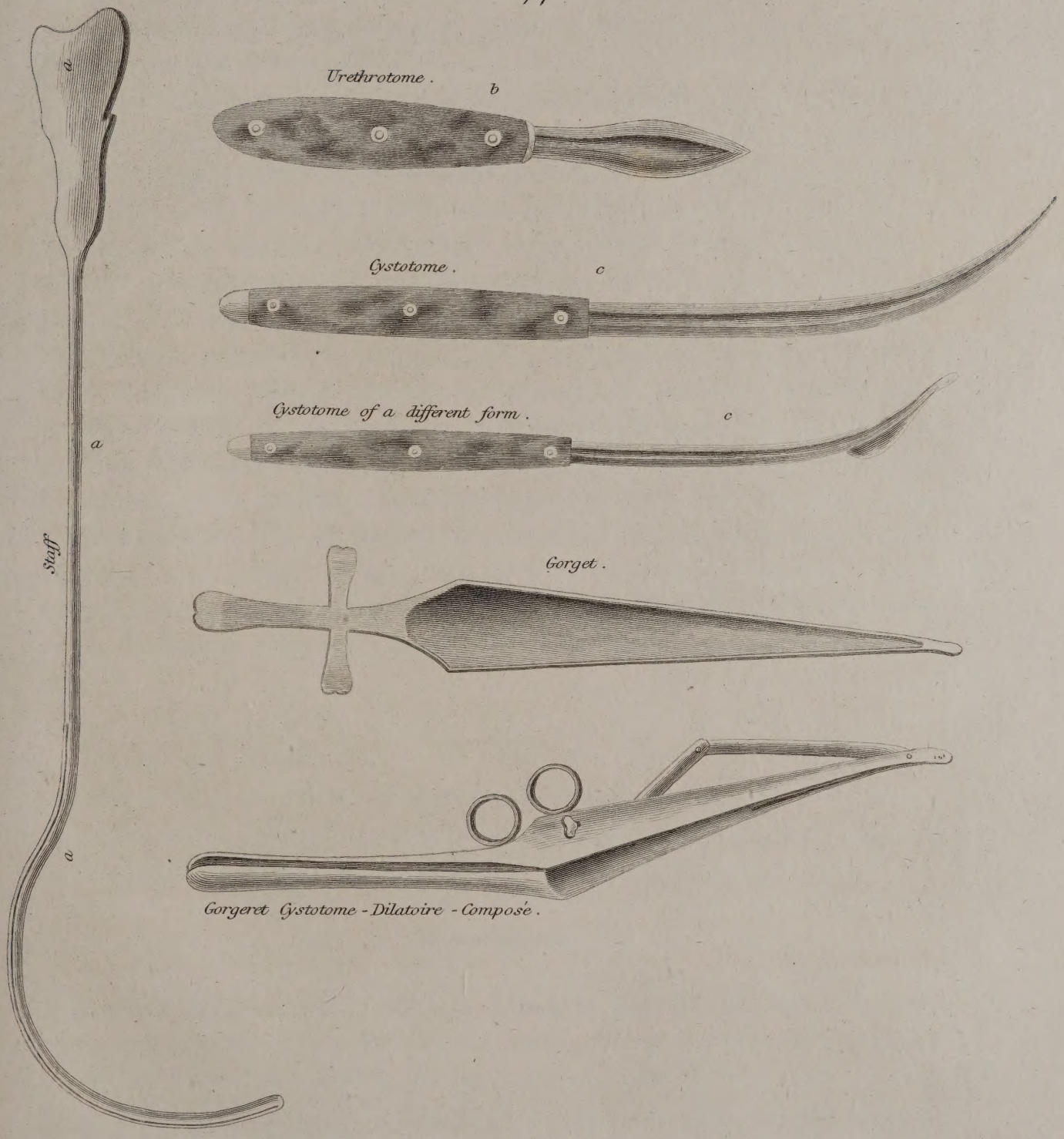
What was the iſſue of ſuch perverſe conduct? Le Cat's talents were loſt to himſelf and to the public; he never became a diſtinguiſhed operator; it was his fate to continue through life, writing volumes full of ingenious theories, the pages of which were never ſoiled by any finger, and to invent inſtruments ſtill more ingenious than his theories, which were never ſharpened for any hand, but his own: even in France, where every novelty has its admirers, Le Cat found no one to praiſe or follow him.

From the ſketches I have given of his inſtruments, my reader will perceive how complex his operation was. One of them, I mean the thing reſembling a gorget, was, in itſelf a whole armory. By raiſing a concealed knife, it made an opening into the bladder; by thruſting forward the canula or ſheath of the knife, it dilated the wound it had made; and when thus lodged in the bladder, it became a conductor for the forceps: this he intitles, with no ſmall degree of ſelf-approbation, his "*Gorgeret-Cyſtotome-Dilatoire-Compoſé*," a title which marks the genius of all his inventions.

Le Cat muſt indeed have had a ſubtile head, even to remember the ſeveral ſteps of his own operation, which was performed ſomewhat after the following manner: Firſt, he introduced his long big ſtaff (a), held, like that of Cheſſelden, by the aſſiſtant ſurgeon, and he cut forward with a common ſcalpell through the ſkin and fat, till he could diſtinguiſh the bulb, the naked urethra, and the proſtate gland: Secondly, with his knife (b) called Urethrotome, having a groove on one ſide, he opened the urethra juſt before the proſtate, and, fixing the urethrotome in the *groove* of the ſtaff, and holding it ſteady, roſe from the kneeling poſture in which he performed the outward inciſion; thirdly, holding the urethrotome in the left hand, he paſſes another knife, the ciſtotome (c), along the *groove* of the urethrotome, and, the beak of the ciſtotome being lodged in the *groove* of the urethrotome, it was puſhed forwards through the ſubſtance of the proſtate gland into the bladder; fourthly, drawing the ciſtotome a little backwards, he gave the ſtaff to an aſſiſtant to hold it ſteady, and, lifting a blunt gorget in the right hand, he laid the beak of

* "Il eſt vrai que le petit couteau de M. Cheſelden que mon célèbre et reſpectable maître M. Morand m'a mis à la main pour faire l'inciſion extérieure et intérieure tout de ſuite, eſt plus ſimple que mon uréthrotome et mon ciſtitome que j'y a ſubſtitué. Mais, 1°. Ce ſimple inſtrument fait avec peine l'inciſion extérieure, et il fait trop petite, dans l'adulte, l'inciſion des proſtates, ce qui l'a fait abandonner par M. Cheſelden même. 2°. Ce petit couteau ne coupe que d'un côté, et ſi l'on y retourne, à deux ou trois fois pour inciſer l'urethre on eſt obligé de le ſortir autant de fois de la cannelure."

Le Cats Apparatus. Page 162.



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it in the *groove* of the ciſtotome, and ran it onwards till it glided from the *groove* of the ciſtotome, along the groove of the ſtaff, and was by the ſtaff conducted into the bladder! then, true to the principles of the apparatus major, and never forgetting his own peculiar theory, that there ſhould be "little inciſion and much dilatation," he bored in his finger along the gorget, dilated the neck of the bladder, and ſo prepared the way for his forceps.

This complex operation I regard as the moſt remarkable and guilty deviation from the dictates of common ſenſe and from the ſound principles of ſurgery; as the firſt attempt to ſubſtitute mechanical ingenuity for real profeſſional talents and ſkill. If the point had been to contrive an operation in mockery of both the old and the modern ſurgery, of the apparatus major, with its number of inſtruments, and of the lateral operation performed imperfectly by timid operators, with ſmall and trivial inciſions, this would have been the very thing required! It is equally a burleſque of both methods, for the apparatus is too complex to be correctly uſed; the inciſion, when made, is too ſmall to admit, without dilatation, even the introduction of the forceps, much leſs the extraction of the ſtone; and this inciſion, ſmall and ineffectual as it was, Le Cat performed by an unguided plunge of a cutting inſtrument, which, in ſuch a ſucceſſion of grooves, muſt have been apt to ſlip. Yet this operation, with all its ſeeming peculiarities, was eſſentially the inciſion of Cheſſelden, accompliſhed in that very way which Cheſſelden himſelf, with all his ſkill and practice, found peculiarly dangerous, viz. by running the knife backwards through the gland with imminent riſk of wounding the rectum and pudic artery.

OF THE OPERATION OF FRERE COSME,

A Prieſt of an Order conſecrated to the Charitable Duties of attending in the Hoſpital; ignorant, like Frere Jaques, of Anatomy or the Principles of our Science.

If we are to ſubſtitute mechanical inventions to real ſkill, let thoſe inventions be ſimple and plain, as Frere Coſme's was, who cut for the ſtone by performing the uſual outward inciſions, ſeeking out the membranous part of the urethra, opening it and introducing a concealed biſtoury, which was drawn out with the blade ſo

raiſed as to cut through the proſtate and make an opening in the cervix veſicæ, proportioned to the angle at which the knife was raiſed from its ſheath.

While Le Cat was in the full ferment of his inventive faculties, and thought he had diſcovered inſtruments which admitted of no competition, this Frere Coſme, an obſcure and uneducated man, communicated to the Journal des Sçavans de Verdun a ſhort letter, announcing his invention of a biſtouri-cachée, with which he imagined he could perform the inciſions for lithotomy without the ſlighteſt danger. This invaſion of what Le Cat claimed as his peculiar province, diſpleaſed him, and he wrote an anſwer full of invective and paſſion, proclaiming the ſuperiority of his own lithotome, and proteſting that it was as much a biſtouri-cachée as Frere Coſme's. Letter followed letter, till the replies and rejoinders amounted to a volume, full of ſound and fury, ſignifying nothing. The letters I have read, or tried to read, and never do I remember to have ſeen the delirium of polemical fury work up to ſuch a ferment, the combatants repeating, like drunken men, the ſame inſignificant things, without conſciouſneſs or meaning. Nothing can be imagined more trivial than any one letter, or more tedious than the whole. Frere Coſme, though he wrote many letters, never ſigned his name; during all the heat and fury of the conteſt, he was known by no other ſtyle than the anonyme; ignorant as he was, he attained (even before his name was made known) to ſome importance by this diſpute; had he been left alone, he and his biſtouri would never have been heard of, but he had the good fortune to joſtle in the dark againſt Le Cat, to whoſe vindictive, ſurly, and inſulting replies, to whoſe reputation and talents for polemical writing, Frere Coſme owed whatever degree of reputation he acquired.

Le Cat, having by his infuriated conduct raiſed up a rival, and by his rudeneſs procured him friends, came to be engaged in a diſpute not to be decided but by an appeal to the lithotomiſts and ſurgeons of the capital; they held a conclave on this queſtion, in which Martiniere, firſt ſurgeon to the king, preſided, the king himſelf condeſcended to take an intereſt in the debate, and received daily reports of the experiments made in hoſpitals upon dead bodies *; Mr. Louis was ge-

* "Pendant que je liſois le précédent mémoire aux ſéances de l'académie, le comité des lithotomiſtes, préſidé par M. de la Martiniere, faiſoit des expériences dans les divers hôpitaux de Paris. Ce chef de la chirurgie, ſi bien intentionné, ſi plein de zêle, avoit communiqué cet utile projet aux miniſtres, au roi même, et rendoit chaque jour compte à ſa majeſté de ce qui s'y paſſoit de principal. Ce grand prince, que ſa bonté caractériſera dans tous les ſiècles, s'intéreſſe à la vie de ſes ſujets au point de ne dédaigner aucuns des détails qui y ont rapport." Le Cat, page 102.

neral ſecretary of the conclave, while each member alſo kept his own private record of the facts. Le Dran, Morand, Foubert, Moreau, all the good ſurgeons of Paris were preſent; Le Cat was preſent in perſon, to perform his own operation; Frere Coſme was invited, but would not come, wherefore De Baſtide with others of his zealous pupils and friends were invited in his place *. The courſe of experiments began in the hoſpital of invalids on the 23d of February 1755, and was continued down to the 14th of March. The bodies were alternately taken in the theatres of the five principal hoſpitals, the Hoſpital of the Invalids, La Charité, L'Hotel Dieu, Salpetrie, and Bicêtre. There were ten ſittings of this committee, and the operation was performed, in all, fifty-one times. When the queſtion was thus brought to the deciſion of the knife, Le Cat performed his own operations, while M. Baſtide repreſented Frere Coſme: mutual accuſations of irregular and dangerous wounds were not ſpared, and the debate became more furious, now that the number of the combatants was increaſed and the anatomiſts with their quotas of retainers were fairly liſted in the field: The battle at laſt grew ſo loud and furious as to be no longer ſafe nor reputable, and a ſudden period was put to this unmannerly ſcene, without coming to that deciſion which Le Cat expected and claimed.

This was to Le Cat a moſt cruel diſappointment; after a turbulent life embittered by perpetual warfare, all his brilliant expectations ended in utter diſappointment. His innumerable improvements had ſo accumulated, that his method of lithotomy was ſuch as no one would be at the trouble of learning, or the hazard of performing. The value of the plain and ſimple inciſions of Cheſſelden, now practiſed in France by Morand, came to be univerſally acknowledged, and the imperfect lateral inciſion of Le Cat was neglected. The diſputes of Le Cat with Frere Coſme had excited ſo much of the ſpirit of intrigue, that the lithotomiſts were afraid to decide †; and ſo powerful were the parties engaged in the diſpute, that the very mention of his propoſed innovation was excluded from the memoirs of the Academy of Surgery. Even the name of Le Cat was not mentioned in the volume of that year, while the encomiums beſtowed by Louis on Frere Coſme are as extravagant and hyperbolical

* He was invited again and again, but no entreaties could prevail with him to come.

"M. le premier chirurgien du roi, l'a invite à nos expériences; ſes avances les plus polies ont été inutiles: la ſurpriſe d'un premier refus n'a pas empeche de faire de nouvelles démarches; elles n'ont pas eu plus d'effet."

† "Dans une réponſe, dont on m'honora le 8 Septembre on me rapelloit cette ſage maxime: *I faut être prudent et céder malgré nous au tems, en attendant des circonſtances plus favorables.*"

tropes as ever iſſued from the mouth of a Frenchman *; ſuch as ſhould have been offenſive to any man of correct taſte, ſuch as muſt have been very galling to Le Cat.

Yet Frere Coſme's was an operation infinitely more dangerous, a ſtroke of the knife leſs under the guidance of the ſurgeon than that of Le Cat. There needs no ſuit of experiments to prove thoſe dangers, which any one acquainted with the anatomy of thoſe parts might confidently foretel. The opening made in the membranous part of the urethra admits the biſtoury to the groove of the ſtaff; by the direction of that groove it is paſſed into the bladder; when lodged in the cavity of the bladder, the ſtaff is withdrawn, and the biſtoury lateralized, or, in other terms, turned with its edge towards the ſides of the bladder and proſtate: all this part of the operation is ſure and ſafe; but the moment the blade is raiſed from its ſheath, the uncertainties and dangers of the operation begin; if the biſtoury be introduced deep, the extremity of its blade wounds the fundus of the bladder †; if it be introduced but a little way, it divides the gland but imperfectly, and makes the extraction of the ſtone laborious; if the blade be turned much downwards, it cuts the rectum; if turned towards the tuber iſchii, opened widely, and drawn boldly, it divides the pudic artery ſo that the patient bleeds to death.

Each of theſe dangers is what might be predicted of this operation, and moſt unfortunately each of them is aſcertained by the moſt melancholy proofs: for Frere Coſme had, by this blindfold ſlaſh of the biſtouri, committed more butcheries than Frere Jaques, Le Raoux, and all the itinerant lithotomiſts! like them, he was ignorant, raſh, and unacquainted with ſurgery! Louis the panegyriſt of his operation found himſelf bound in honour to acknowledge the facts; and Frere Coſme was ſo ſecret in his operations, ſo jealous of admitting ſtrangers or any that were not entirely attached to him ‡, his conduct was ſo widely different from that of Frere Jaques or Le Raoux, that the Academy were naturally inclined to believe that there muſt be ſome danger where there was ſo much myſtery in the operations of

* "Il n'étoit pas queſtion de paroitre devant des juges, l'auteur du lithotome cachée auroit été le notre: perſuadé de l'excellence de ſon inſtrument, il ne pouvoit prevoir que plus de reputation et de gloire, en venant partager ſes lumieres avec nous."

† This danger is illuſtrated in the drawing I have given of Le Cat's lithotomy.

‡ "Il prend un grand ſoin d'opérer le plus ſecrettement qu'il lui eſt poſſibbe; il n'admit que des temoins aſſidés autant qu'il le peut; cette conduite eſt tout-à-fait différente de celle qu' ont tenue Raoux, le Frere Jacques, et tous ceux qui ſe ſont donnés pour inventeurs de méthodes particulières. La confiance que quelques ſucces leur avoient inſpirée les portoit à augmenter le nombre des temoins de leurs procedes, ils cherchoient des approbateurs, le concours des ſpectateurs de leurs opérations etoient prodigieux."

this Frere Coſme, and were vindicated in receiving the following facts on the teſtimony of various ſurgeons.

" Often the proſtate was ſo imperfectly cut, that the reſiſtance from the undivided gland occaſioned a moſt laborious operation ; ſometimes Frere Coſme ſtruggled in vain, for half an hour, trying to extract the ſtone, and was forced to introduce the biſtouri a ſecond and even a third time, raiſing the knife to a higher degree (for the riſing of the blade was graduated by a ſcale) in order to make a wider ſtroke." " In cutting M. de Chery, Lieutenant-Colonel of the regiment de Saintonge, he introduced his forceps twenty times, and, after having ten times brought the ſtone to preſent under the pubis, at the lips of the wound, after exhauſting the patient with fruitleſs and dreadful attempts, he was obliged to introduce the biſtouri again and enlarge the wound. The ſtone was indeed extracted, but the patient died."—" Frere Coſme again, in cutting a prieſt of St. Lazare, of Fontainbleau, laboured a full half hour in the extraction of the ſtone; three ſeveral times did he introduce his biſtouri, and repeated the inciſion. This patient alſo died in twenty-four hours."

" When he cut Moreau, profeſſor of philoſophy in the college of Montaign, the forceps paſſed into the bladder with the greateſt difficulty, and that only after repeated attempts, and with the help of two buttoned probes or conductors. The forceps were ſix times introduced, and always with the ſame difficulty, which clearly proves an imperfect ſection of the proſtate : the patient lay for half an hour under his hands ; the hæmorrhagy was ſtopped with great difficulty, and ſo imperfectly, that on the nineteenth day the patient died."

" Frere Coſme had the ignorance to cut for the ſtone a young man, in whom the ſtone was ſo lodged in the neck of the bladder that a ſmall inciſion with a common ſcalpell, by cutting upon the gripe, would have ſaved him : yet in this caſe Frere Coſme had the cruelty, when making a ſecond ſtroke with his murderous knife, to gag the patient, and make his mouth be holden by a ſervant of the hoſpital to prevent his cries. This young man remained long fiſtulous, and in all probability never was cured *.

* " Un jeune homme de vingt-un ans qu'il a taille à l'Hotel Dieu de la Ville de Nantes. La pierre étoi engagée dans le col de la veſſie ; il jugea qu' elle en rempliſſoit exactement la capacite, et ſe ſervit de ſon inſtrument ſur l'idee qu'il avoit priſe due volume exceſſif de la pierre ; apres des tentatives inutiles, il fallut revenir à l'inſtrument tranchant. Le malade ſouffrit beaucoup, et pour l'empecher de crier on lui faiſoit fermer la bouche par un infirmier. Aprês un grand quart d'heure de travail, on tira la pierre, qui n'etoit point groſſe, et pour l'extraction de laquelle on auroit du pratiquer tout ſimplement le petit appariel, et ſe ſervir du crochet à curette dont tous les praticiens connoiſſent l'utilite en pareil cas."

" The rectum was found to be cut on opening the body of a prieſt of the pariſh of St. Roch, cut by Frere Coſme."—" M. Boucot, ſurgeon at Troyes, acknowledged that, in dreſſing one of his patients cut by himſelf with the biſtouri cachée, air and fæces iſſued from the wound."

In many of Le Cat's operations, the great pudic artery was cut, ſo that the patient died almoſt immediately. In ſome caſes the greater branches of the pudic artery were divided, the bladder was ſo filled with clotted blood, as to occaſion a deſire to paſs the urine, with intenſe abdominal pains; the clotted blood being removed by injections of tepid water, the hæmorrhagy continued inceſſantly till the patient fainted and died. "A curate of the dioceſe of Sens, being cut in La Charité with the biſtouri cachée, bled profuſely; the bleeding was ſtopped by the introduction of a canula, but, returning three times during the firſt fifteen days, the patient expired on the ſixteenth, exhauſted with loſs of blood."—" Le Sieur Forceville died on the ſeventh day, of a ſlow hæmorhagy, which had never ceaſed from the moment of the operation."

" Frere Coſme performed his operation on Mr. Crin, judge of the city of Compiegne, on the 9th of November 1754. After many ineffectual attempts, he at laſt ſucceeded with the curved forceps in extracting a ſmall ſtone (weighing only half an ounce). The patient was, as uſual, laid in bed without any dreſſing, notwithſtanding a degree of hæmorrhagy from which he was very faint; two hours after the operation, the blood continuing to flow, Frere Coſme was forced to introduce a ſilver canula into the wound, wrapped round with agaric. About midday Mr. Crin deſired moſt importunately to be allowed to paſs his water. The bladder was injected with tepid water through the canula, which was then withdrawn; but by ſix in the evening, the hæmorrhagy having been inceſſant, the patient fell into faintings and expired in preſence of Frere Coſme."

Theſe authentic and impreſſive facts will bring home a moſt inſtructive leſſon to the minds of thoſe who have ſuppoſed it poſſible to ſubſtitute mechaniſm to ſkill, and to forge inſtruments of ſo happy a ſhape as to perform a diſſection at one ſingle ſtroke. Theſe facts give the lie at once to all the vain promiſes of the inventor, who boaſted of this as the chief excellency of his invention, that the biſtouri cachée might be ſafely put into the hands of any ſurgeon, ſince it was guided as eaſily and ſurely by the moſt ignorant, as by the moſt ſkilful *.

* " Dela on a conclu que le nouveau lithotome pouvoit être mis avec confiance entre les mains de toute ſortes de chirurgiens, de différens degres de genie et d'adreſſe: que tous feront uniformement la même operation, ſans crainte de manquer de préciſion *qu'elle ſera executée auſſi parfaitement par l'homme qui a*

Sketches of Le Cat's & Frere Cosme's Operations. Page 168.

Sketch of Le Cat's Lithotomy.

Sketch of Frere Cosme's Lithotomy.

Frere Cosme's Knife.

Le Cat's Knife.

Drawn by I.Bell.

Engraved by E. Mitchell.

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He compared the biſtouri cachée with a pair of compaſſes, which, being opened to a certain degree, make circles of like diameters, whatever hand turns them; but he little conſidered the variety of ſize and texture of theſe parts in different ſubjects, and their mobility and variable poſture in all ſubjects, the ſlighteſt turn of the hand giving a different effect to the ſtroke of the knife. No graduation of the handle can regulate the inciſion among parts ſo moveable. In place of being an inſtrument equally ſafe in any hand, it is equally dangerous in the hands of the ſkilful and of the unſkilful. Nothing ſurely can be more inſulting to common ſenſe, than to ſay the virtue is not in the operator, but in the knife! yet it is no wonder the Friar boaſted of this quality of his knife, for in himſelf there was none! this was the only privilege he could lay claim to! If his knife was ſo contrived that with it any rude or ignorant man might operate ſafely, the inventor of ſuch knife was indeed entitled to operate! Frere Coſme did accordingly put this in the front of his eſſay, which was inſcribed, "THE DESCRIPTION OF AN INSTRUMENT FOR CUTTING FOR THE STONE, ADAPTED TO ALL CAPACITIES." *

OPERATION OF M. FOUBERT, SURGEON IN PARIS, AND MEMBER OF THE ROYAL ACADEMY.

When once the principle is openly avowed, of ſubſtituting mechaniſm to ſkill, and inventing inſtruments by which an operation may be performed even by the ignorant, all reſtraint vaniſhes, and one invention follows another in rapid ſucceſſion. This is a pleaſing and ready indulgence; ingenious trifles are eaſily invented; idle men are glad to find this ſhort way to diſtinction and celebrity, and well pleaſed to eſcape the labour of ſtudy. While the man of real knowledge, who ſtudies his profeſſion faithfully, and is familiar with diſſection, feels that he could accompliſh whatever he deſigns with the common knife, and thinks of no other; the indolent man inſpired, as he imagines, with a genius for inventing new

Le moins d'experience que par lithotomiſte le plus conſommé. Ce ſont les propoſes expreſſions de ceux qui ont loué le nouveau lithotome.

* The title under which he deſcribes his knife is, "DESCRIPTION D'UN INSTRUMENT AVEC LEQUEL ELLE SERA FACILE À EXECUTER LA TAILLE PAR TOUS LES CHIRURGIENS."

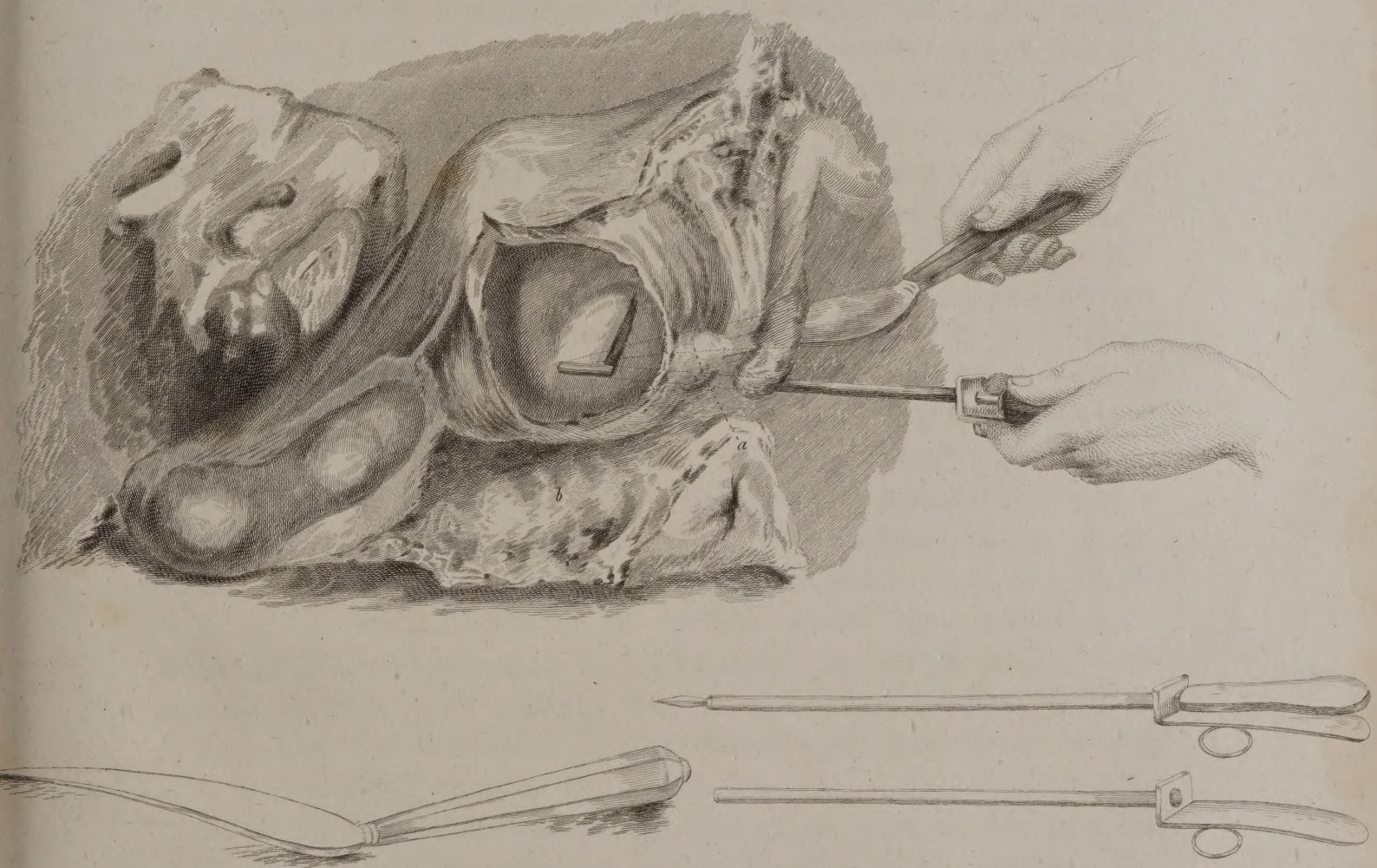
operations and curious inſtruments, ſits and contrives ingenious things, which his friends never fail to praiſe, while all the world beſides diſregards them.

Foubert was one of thoſe, who, being deceived by the report of Albinus, believed that Raw made his inciſion into the body of the bladder only, and behind the gland, and he imagined that the beſt of all operations was that which ſaved the urethra and cervix veſicæ (viz. that part which is ſurrounded with the proſtate gland) entire *.

Foubert deſigned to make his way directly into the bladder by one ſtroke of the knife, without any of the uſual inciſions, and for this he invented the inſtruments which are here preſented along with the plan of his operation. He firſt paſſed the forefinger of his left hand into the anus to guard the rectum, by preſſing it aſide; he next, with the forefinger of the right hand, ſought out the tuber iſchii, and, having marked that point, he ſtruck a ſlender trocar and canula directly into the bladder, the trocar paſſing in the middle betwixt the anus and tuber iſchii, and he knew that it had penetrated into the bladder when the urine iſſued through the trocar: Then retracting the trocar a little, without drawing it quite out of the canula, he introduced the point of a ſlender knife into a groove or ſlit in the canula; by the guidance of that ſlit, he ran it onwards into the bladder, and was aware of the knife having actually reached the bladder, by the urine flowing ſtill more freely: Then, raiſing the knife from the ſlit of the canula, he made his inciſion, about an inch and a half in length, through the neck of the bladder, by moving the knife from that point at which it had entered upwards towards the pubis: And finally, by moving the handle more largely than the point of the knife, he opened the outer part of the wound to whatever degree the ſize of the ſtone ſeemed to require, and then, withdrawing the knife, he introduced a blunt gorget to guide the forceps. By the plan I have demonſtrated that his trocar entered behind the proſtate gland (a), above the ureter (b), and ſo paſſed into the body of the bladder. Foubert vainly imagined that he was at once imitating both the operations of Raw and of Celſus, and fulfilling the true theory of lithotomy, that whatever faults might be imputed to his operation, the danger of fiſtula could not be of the number, ſince the urethra and cervix were left entire. How vain ſuch expectations were, I have already proved: yet it was for this

* "Les reflexions que j'avois faites ſur la methode de M. Raw, telle qu'elle eſt décrite par M. Albinus, me firent entrevoir que la perfection de l'operation de la taille conſiſtoit à ne point intereſſer le col de la veſſie ni l'uretre, et a procurer à la pierre une ſortie par l'endroit le plus large de l'angle, que forment les os pubis; il me parut que le lieu le plus favorable pour entrer dans la."

Fouberts Operation — *Page 170.*



Drawn by I. Bell.

Engraved by E. Mitchell.

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excellency chiefly that Louis commends Foubert's method, ſaying, "Les *voyes naturelles de l'excretion de l'urine* et de la matiere prolifique *ne ſont léſées en aucun maniere.*"

Mr. Thomas, another ingenious member of the Pariſian ſchool, improved Foubert's operation to the higheſt point of abſurdity, by ſtriking his trocar, not near the tuber iſchii, but into the higheſt point of the perinæum, cloſe under the pubis; reverſing the order of inciſion, he made, in a downward direction, that inciſion which Foubert had made from below upwards; and finally he joined to the canula a concealed knife, which, upon preſſing the handle, roſe out of a groove. Here all kinds of raſhneſs were effectually combined; the adventurous and unguided plunge of Frere Jaques was exemplified in the driving in of the trocar; the inadequate, and yet dangerous and irregular inciſion of Frere Coſme in this concealed knife; and, by directing the edge of this knife downwards, he multiplied all the dangers by turning it directly againſt the rectum and the pudic artery.

Our judgment on theſe inventions muſt be naturally guided by what we know of other experiments and other inventions. If it was dangerous to go ſo deep as Raw was ſuppoſed to do, although he made his way to the body of the bladder, by a deliberate and ſkilful diſſection; what muſt it not be to ſtrike a trocar into the pelvis under the pubis, without even a catheter (for Foubert uſed neither ſtaff nor catheter) to guide it to the bladder, and then, without any diſſection or any form of outward inciſion, to cut through all the parts with a flap-daſh ſtroke of the knife? We know from experience, in the operation of Frere Coſme, the dangers to which the rectum and the pudic artery are expoſed by ſuch a ſtroke; we know how inadequate the inciſion made by ſuch a movement of the knife is, to the complete ſection of the gland; we know that along with every other danger there is this peculiar to the unguided ſtab of Foubert's operation, that the operator may altogether miſs the bladder. Frere Jaques, when he plunged his dagger-like knife into the bladder, was guided by a ſtaff, he ſtruck his knife into the apex of the hip, and, by enlarging his wound downwards as well as upwards, cut fairly the muſcles of the perinæum, and provided a ſufficient opening for the exit of the ſtone: But Foubert, ſtriking his trocar by the ſide of the tuber iſchii, and cutting only upwards towards the pubis, failed to cut the tranverſe muſcle or to remove the chief obſtacle to the extraction of the ſtone.

It is a paramount objection to all thoſe operations in which the knife or other inſtrument is ſtruck thus at random into the bladder, that the ſurgeon finds much

difficulty in ſtriking the bladder with his trocar in the moſt urgent of all caſes, a ſuppreſſion of urine, ſuch as threatens gangrene, where the bladder, in ſhort, is ſo diſtended as to occupy the whole cavity of the pelvis, expoſing itſelf fairly to the ſtroke. Let it be always remembered by the ſurgeon, that the alternate fulneſs and emptineſs of the bladder and rectum ſo entirely changes the place and form of each, that it depends altogether upon the ſtate of diſtenſion of the bladder, what part of it you ſtrike with the trocar, or whether, in aiming at the bladder, you do not rather plunge into the rectum. From every conſideration, I hold it to be an indiſputable axiom that the operation of lithotomy never can be ſafely made a plunge in the dark, but muſt be a deliberate diſſection.

OF THE CUTTING GORGET OF SIR CÆSAR HAWKINS.

It is ſingular that the hiſtory of that operation which we now perform, or rather of that particular inſtrument with which we make the moſt critical part of the inciſion, is leaſt of all known. There is a taciturnity about the Engliſhman, which, even while he is proud of his invention, prevents any unſeemly ebullition of vanity; he contrives an inſtrument, finds it uſeful, his friends approve it, and he ſays no more about the matter. The invention of the lateral operation of lithotomy by Cheſſelden, though a moſt intereſting improvement, was but ſlightly mentioned by himſelf, or by his pupil the celebrated Sharp, but was fairly emblazoned by Morand. The invention of the cutting gorget by Sir Cæſar Hawkins was in like manner very ſlightly mentioned by Warner, and by Sharp, in his critical inquiry: but had it, like the operation of Cheſſelden, been deſcribed by the loquacious and eloquent members of the French academy, it might have made as ſplendid a figure as the biſtouri cachée of Coſme, or the gorgeret-ciſtotome-dilatoire-compoſé of Le Cat.

Of all the changes on the operation of lithotomy, the invention of Hawkins's cutting gorget was the leaſt obſerved, becauſe it was a change not in the deſign of the lateral lithotomy, but merely in the form of the inſtrument with which it was performed. There were, beſides, many previous inventions which prepared the public mind for the novelty; the inſtrument itſelf, the gorget, was not new, but had been long uſed as a dilator to enlarge the wound of the proſtate, and as a conductor

for guiding the forceps. The ſole change propoſed by Hawkins was to ſharpen the edge of the inſtrument, that it might perform, at once, the double office of knife and conductor, and ſurgeons were apparently pleaſed with a contrivance which ſaved them from the reſponſibility of diſſecting parts, with the anatomy of which all were not equally well acquainted;—experience alone has gradually proved how dangerous this gorget is.

"Mr. Serjeant Hawkins (ſays Sharp, p. 213.) ſeems to have fallen upon a moſt ingenious contrivance, not only for removing them (viz. the defects of the inſtruments uſed in lithotomy), but alſo giving the laſt hand towards perfecting the lateral operation; this he effects by making his gorget cut on the right ſide, ſo that when it is introduced upon the ſtaff and puſhed on into the bladder, it neceſſarily makes an inciſion on the left ſide of the urethra and proſtate gland, and thus avoids the danger of wounding the rectum; and, *as the internal inciſion is to be made in the ſame manner as when you propoſe to open the proſtate with the knife*, the extraction of the ſtone will be accompliſhed with all the ſame eaſe."

This operation is eſſentially the lateral operation of Cheſſelden and Morand; and the lateral operation, whether performed by the knife of Cheſſelden, the ciſtotome of Le Cat, the biſtouri cachée of Frere Coſme, or the gorget of Hawkins, is ſtill eſſentially the ſame, AN INCISION EXTENDING LATERALLY THROUGH THE PROSTATE GLAND, FROM THE MEMBRANOUS PART OF THE URETHRA, TO THE BODY OR MEMBRANOUS PART OF THE BLADDER.

In operating with the gorget, the external inciſion is made with the knife; the membranous part of the urethra is then opened, by turning the edge of the knife up towards the groove of the ſtaff; the beak of the gorget is then fixed in the groove of the ſtaff, which is to conduct the inſtrument into the bladder; the gorget, cutting laterally, is then thruſt forwards through the gland; and when the urine ruſhes out, which is a ſignal of its being thruſt home into the bladder, the forceps are introduced along the hollow of the gorget.

What objection then can there be, to an inciſion ſo fairly lateral, ſo apparently ſafe, ſo perfectly correſponding with the diſſection of Cheſſelden? Many! of which one is principal and concluſive: THE GORGET SLIPS! and all the ſurgeons of Europe confeſs it! it ſlips in the hands of the moſt ſkilful ſurgeons, and no one can be reſponſible for the conſequences of a thruſt ſo deſperate, and requiring ſo much force: it ſlips ſo frequently, and is avowedly ſo little under the controul of the operator, that no man ventures to blame his brother for a misfortune which may

happen in his own hand. So imperfect is the inſtrument, and ſo dangerous this plunge, that to prevent the gorget being driven through the fundus of the bladder, is a point of ſo much importance as to occupy, to this day, the genius of inventors, who have thought to guard the edge by a double or ſlipping gorget! and ſo far is the inciſion, after it is ſafely made, from being adequate to the extraction of the ſtone, that the ſize and form of the gorget, and eſpecially the expanſion of its blade, the broadneſs of its cutting edge, varies every day: The inſtrument was once conical, but is now cylindrical; it was once narrow, but is now broad; it was once double, with the beak in the centre, it is now ſingle, with the beak on one ſide; when firſt ſharpened by Sir Cæſar Hawkins, it was round, becauſe it had been immediately before a mere dilator; it is now flat and entirely reſembles a knife.

It is not without reluctance that I rank this among the inventions where mechaniſm is ſubſtituted to ſkill: If this form of inſtrument were found ſafe in practice, I ſhould be as little apt as any man to be infected by ſpeculative fears; but it is a murderous weapon! When the daſh is made with the gorget, either it is at once ſucceſsful, or, if wrong, is irretrievably ſo; for, though in operating with the knife you can make a ſecond inciſion, in operating with the gorget, if you fail in the firſt, you can make no ſecond plunge. The beſt operators of this country, among whom, I have no doubt, I may reckon Mr. Earle, acknowledge the dangers of this operation in the fulleſt and moſt unqualified terms: "I HAVE MORE THAN ONCE KNOWN A GORGET, THOUGH PASSED IN THE RIGHT DIRECTION, PUSHED ON SO FAR, AND WITH SUCH VIOLENCE, AS TO GO THROUGH THE OPPOSITE SIDE OF THE BLADDER." * I have myſelf ſeen it driven, God knows where, deep out of ſight, up to the hilt, without one drop of urine iſſuing, without the operator ever reaching the ſtone †. Obſerve but the force with which the operator drives in the gorget; mark the ſtruggle with which he diſengages the beak of the gorget from the groove of the ſtaff; hearken to the audible clack with which the beak of the gorget ſhoots off from the groove of the ſtaff; and if this moment of violence do not conſpire with the outcries of the unhappy patient to perſuade you of the dangers of this operation, you can have but little pretenſion to either feeling

* Earle on the Stone, page 53.

† One gentleman in this city printed (after an accident of this kind) his vindication with this motto, "Extenuate nought, or ought ſet down in malice." It has been my fortune to hear more than one vindication publicly read, but I cannot ſay I thought them elegant compoſitions. The common way, I believe, is beſt,—to ſay nothing about it.

or knowledge. Such is the rude violence with which the gorget is driven inwards, that Broomfield, even when operating with a blunt gorget, a mere dilator, burſt through the bladder and peritoneum; his gorget went almoſt beyond his reach into the abdomen, while the bowels of the boy fell down among his hands *.

But there is one paramount objection, independent of the many dangers which attend this puſh of the gorget; the inſtrument, guide it how you will, makes an inciſion inadequate to the eaſy extraction of the ſtone! I have often compared the inciſions I have made with the knife, and with the gorget, upon the dead body, and the ſketches which I ſhall preſently ſubmit to my reader will prove the fact. I have obſerved alſo, in the time of operating, how difficultly the opening of the proſtate admits even the forceps, how impoſſible that ſuch an imperfect inciſion ſhould eaſily allow the extraction of the ſtone. In all caſes of particular difficulty, where, uſing the privilege of an aſſiſtant, I have introduced my finger, I have felt diſtinctly the ſtricture of the gland, the greater part of it being left entire. The inciſion in the gland often admits the forceps ſo difficultly, that I am well aſſured the gland itſelf has ſometimes, by the mere puſhing of the forceps againſt this firm and narrow opening, been entirely ſeparated from the urethra! and after the forceps are puſhed ſucceſsfully through this narrow opening, and the ſtone catched betwixt their blades, all that remains of the gland is inevitably lacerated with much danger and pain. But I would more willingly quote any authority than that of my own diſſections or experience: Camper, who has ſtudied the ſubject, ſays, "Incredibile eſt quàm parva plaga ab omnibus etiam dexterrimis infligatur; nunquam forcipem robuſtam exciperet niſi dilataretur. Hawkenſius ſolo conductore, cujus margo dexter in aciem aſſurgit, idem præſtat; *omnes plagam dilatant, ut calculum extrahant: dilaceretur igitur ſemper veſicæ oſtium et proſtata.*" Page 14.

But higher and better authority remains behind. Deaſe was, if I judged rightly of his talents, a ſtern and rude ſurgeon, but perfect in all the theory and practice of his art; he was not very explicit in his communications with me, but, from his manner and the movement of his hand in demonſtrating to me, rather than from what he ſaid, I conclude that he cut after the manner of Raw, making the inciſion with the right hand, while he held the ſtaff with his left. "In all the trials (ſays Deaſe)

* Bromfield, like every other malefactor, has a ſpecial pleading on the relevancy of the libel. "I am of opinion (ſays Bromfield) that the elongation of this lateral ligament (viz. of the peritoneum) was occaſioned by the repeated ſcreaming of the child during the paroxyſms of the ſtone." page 270.

"Nec Deus interſit niſi dignus vindice nodus."

that I have made with the gorget on the dead ſubject, I never found the opening into the bladder ſufficiently large for the extraction of a ſtone of a middling ſize, without a conſiderable laceration of the parts. I have frequently taken the largeſt-ſized gorgeret, and could not find that, in the adult ſubject, I ever *entirely divided the proſtate gland, if it was any way large;* and in the operations that were performed here on the living ſubject, if the ſtone was large, the extraction was painfully tedious, and effected with great difficulty, and in ſome caſes not at all."

The gorget, like the knives of Le Cat and Frere Coſme, is a mechanical contrivance, for performing, at one ſtroke, an inciſion which ſhould be made with intelligence, by ſlow diſſection, large or ſmall, according to the proportions of the parts: It reduces the operation to the level of all capacities: It abrogates all diſtinctions, and puts the moſt ignorant almoſt on a level with the moſt dextrous ſurgeon: It inclines every young ſurgeon, who has but ſeen the gorget thruſt into the bladder, to undertake an operation, with the hiſtory, theory, or manual execution of which he is altogether unacquainted. If indeed this mechaniſm of the gorget and grooved ſtaff were ſo perfect that the worſt ſurgeon were really as capable of performing the operation as the beſt, there would be nothing to regret: but, unhappily, the theorem is expreſsly reverſed; the beſt and moſt ſkilful ſurgeon is in this affair little better than the moſt ignorant; no man who knows the danger of this particular operation, would declare himſelf reſponſible for the event. The gorget, if ſmall and narrow in the blade, makes an inciſion inadequate to the extraction of the ſtone; if made broad, that it may cut fairly through the whole body of the proſtate, it enters the pelvis with difficulty, paſſes cloſe to the bone, and endangers the pudic artery; and ſtill, however broad, does not fairly cut through the gland, nor make an adequate inciſion! It is the ſame blindfold ſtroke with the inciſion of Frere Coſme, having, beſide, this peculiar diſadvantage, that this peculiar form of knife, this cutting gorget is not firſt inſinuated into the bladder along the groove of the ſtaff, and then drawn outwards, with the ſingle danger of wounding the pudic artery;—but, is daſhed inwards upon the bladder, with the riſk of either ſtarting off from the groove of the ſtaff, and ſo miſſing the bladder! or of miſſing the bladder by puſhing the proſtate gland off from its connection with the urethra! or of plunging, not into the bladder, but into the cellular ſubſtance ſurrounding the rectum! or of being driven into the gut itſelf! or, worſe than all, of plunging through the gland, through the cavity of the contracted bladder, and through the fundus, among the viſcera of the abdomen.

Often, I am perſuaded, the lithotomiſt fails to ſeize the ſtone, from its having paſſed through ſuch a wound into the cavity of the abdomen.

One anecdote in ſurgery, one ingenious contrivance more, I do remember, and ſhould be ſorry not to commemorate. There was, in the time of Pallas, and while he ſtudied in this country, an Engliſh ſurgeon, whoſe invention he praiſes, but, in charity (as I would conſtrue it), does not mention his name; it was a pair of forceps with a deep groove, and in that groove a concealed knife. After making the uſual inciſions, this anonymous ingenious gentleman introduced his forceps, ſeized the ſtone, raiſed the concealed ſcalpell from its groove, and, turning the armed or ſharp blade of his forceps towards the perinæum, towards the lower angle of the wound, cut in proportion as he extracted, and could not fail to have a wound *perfectly ſufficient* for the paſſing of the ſtone. Pallas does indeed inform us, that various high conſiderations induced this ingenious ſurgeon to deprive the world of the benefit of this invention *. I wiſh a man of ſuch ineſtimable prudence had been alſo the inventor of Le Cat's gorgeret-cyſtotome-dilatoire-compoſé, of Frere Coſme's biſtouri, and of Hawkins's gorget! or that theſe ingenious gentlemen had been bleſſed with the prudence and charity of the inventor of the *cutting forceps*.

I will cloſe this diſcourſe with ſome thoughts of the celebrated Mr. Sharp, in his critical inquiry into the preſent ſtate of ſurgery. The paſſage I am now going to quote has greatly attracted my attention, becauſe I have been long perſuaded that many have been employed in inventing inſtruments, who would have been better occupied in learning to operate. Sharp ſays, "A reaſonable variety of inſtruments is an eſſential aid to ſurgery; yet it may be obſerved that this ſupplement to the hand has been ſo much attended to by moſt ſurgeons, *that dexterity itſelf has not been ſufficiently cultivated*; and it is very remarkable, that in proportion as the art of operating has been improved, the number of inſtruments has been generally retrenched. Dionis reflects on the ſuperfluity recommended by Scultetus; ſome of the moderns condemn Dionis for the ſame exceſs; and perhaps the future generation will diſcard many of thoſe now in vogue with the preſent age; I am *apt to believe that, ſhould they attain to a farther perfection in the art of operating*, than we are now poſſeſſed of, *it will poſſibly be as much owing to an acquired dexterity, as to any mechanical inventions*."

* "Multa vero ſunt atque varia, quæ hujus inſtrumenti uſum diſſuadent; et proculdubio perſpecta, autorem commoverunt ut non inventum publici juris fecerit."

This is an opinion to which I ſubſcribe with ſincere good will; I hold in reverence the ingenuity which affords us new reſources in a difficult ſcience; but I muſt ſee ſuch ingenuity founded on profeſſional knowledge before I can add my tribute of applauſe; I hold in contempt thoſe only who would ſubſtitute ingenious inſtruments to manual dexterity and a knowledge of the parts. There never was a man old and ſkilful in our profeſſion, who did not feel confidence only in his own hand and ſenſes; and this is rudely called prejudice! There never was a boy entering upon our profeſſion who had not a taſte, and, as he imagined, a talent for ingenious mechaniſm and new operations; a folly which has its natural cure in experience and real knowledge. Le Cat ſpent his life in trifling inventions, without ever being able to perſuade his meaneſt or moſt ſervile pupil to operate after his manner. Raw and Cheſſelden were careful only to be thoroughly acquainted with the anatomy of the parts, and deſired no more complicated apparatus to diſſect with, than a knife and a ſtaff. This is a fact, in itſelf, ſo convincing, that no argument could give it farther importance.

ANATOMY OF THE LATERAL OPERATION, AS PERFORMED WITH CHESSELDEN'S KNIFE OR HAWKINS'S GORGET.

We have reviewed a chaos of ſurgical projects, in order to arrive at the ſolution of this ſimple queſtion: "Since the lateral inciſion is plainly preferable to all others, will it be moſt advantageouſly performed by Cheſſelden's knife, or by Hawkins's cutting-gorget?" Every ſtep of this analyſis of the inventions of others has, I am perſuaded, enabled my reader to eſtimate more juſtly the value of the modern operation which I am now to explain; and to perform it with more deciſion and boldneſs, deducing the deſign and meaning of every ſtep from the variety of ways in which the ſame parts have been cut by others. What remains for me to do, is to compare the effects of the inciſions made by the knife and by the gorget, and I ſhall think I acquit myſelf of my duty very imperfectly if I do not enable my reader to cut with equal confidence with the gorget or with the knife.

The lateral inciſion of the Engliſh ſurgeons differs from the lithotomy of Frere Jaques, Raw, and Foubert. Theirs was, or was reputed to be, an inciſion into the body of the bladder behind the proſtate gland. Ours is an inciſion through

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the ſide of the proſtate, and is entirely the ſame whether performed by the compound-ciſtotome of Le Cat, the biſtouri of Frere Coſme, the knife of Cheſſelden, or Hawkins's cutting-gorget.

The ſuperiority of this operation is demonſtrated: We are now to decide whether the inciſion ſhould be performed with a knife or with the gorget; and, in reducing this theorem to demonſtration, I will not truſt to the trivial plans which I have hitherto uſed for illuſtrating the operations of the older ſurgeons. Such plans, however correctly imagined, are hypothetical merely! I am to repreſent the actual fact! I am to ſhow what form and extent of opening is produced, on one hand, by the puſh of the gorget, on the other, by the inciſion of the knife; having made ſketches from repeated diſſections of the ſubject, that I might not be deceived myſelf, I have drawn them of the full ſize of nature, that the young ſurgeon might not form falſe or imperfect conceptions of the ſize or relative poſture of the parts.

The drawings 6, 7, 8. are diſſections of the parts in the ſucceſſive ſtages of the operation of lithotomy.

Plate 6. is a drawing of the internal parts, i. e. the bulb of the urethra, the membranous part of the urethra, the proſtate, and the levator ani muſcle, preſented in the direction in which they lie to the operator. This is a moſt intereſting diſſection, ſince it indicates what is next to be done after the external inciſion. The ſtaff thruſt down through the penis is marked (a); the hair of the pubis (b); the ſcrotum, incloſing the teſticles, (c); the ſkin of the perinæum juſt behind the ſcrotum is diſſected up, and drawn aſide by the ſtring (d), ſo as to expoſe the diſſection of the urethra; the ſkin which covers the tuber iſchii is diſſected up, and held aſide by a ſtring marked (e); while the tuber itſelf, a great mark in our operation, is marked (f).

I ſhall now deſcribe, firſt, the parts lying in the perinæum, and next, thoſe lying in the hollow of the pelvis. The general body of the urethra, where it lies under the arch of the pubis, I have marked (g); the particular bulging named the bulb, and which lies along the perinæum, from the ſcrotum to the anus, I have marked (h); the muſcle which covers the bulb, named accelerator, is diſſected up and held aſide by a thread; the horn or tendon of this accelerator muſcle is marked (i); and the body of the muſcle, where it is held aſide to ſhow the bulb, is marked (k). (l) marks the arch of the pubis; the tuber iſchii is marked (f); one of the muſcles

of the back of the thigh, ariſing from the tuber iſchii, is markc (l); the ſmall muſcle of the penis, named the erector, is marked (m).

The parts within the pelvis are eſpecially important: in the great hollow of the pelvis under the tuber iſchii and behind the pubis, lies the proſtate gland; the membranous part of the urethra is, in this drawing, covered by the bulb, the pendulous part of which lies before it; the gland, marked (n), is ſeen immediately behind the bulb, under the arch of the pubis and above the rectum. The bulb, the anus, and the rectum, are pulled a little out from the pelvis, to ſhow the extent of the powerful and fleſhy muſcle, the LEVATOR ANI. The opening of the anus is marked (o); the ſphincter ani, mixed with maſſes of fat and cellular ſubſtance, immediately ſurrounds the verge of the anus, and is marked (p); the great maſs of the levator ani muſcle, covering the rectum, is marked (g); one faſciculus of fibres, more cloſely covering the proſtate gland, is marked (r); and let it be remembered that from this edge (r), a conſiderable portion of the levator was cut away to expoſe the gland and uncover the membranous part of the urethra.

Theſe parts, lying in the perinæum and pelvis, are viewed in this drawing ſomewhat obliquely, and are nearly in the poſture for lithotomy. Firſt, it will be remarked that the bulb lies ſo before the membranous part of the urethra, that you cannot eaſily reach the membranous or naked part, but by a lateral diſſection. Secondly, the young ſurgeon muſt remark that the ſtaff, in performing the operation of lithotomy, is to be felt for, not by turning the finger towards the bottom of the wound, towards the deepeſt part of the diſſection: I have remarked that thoſe, unaccuſtomed with lithotomy, uſually feel for it there, and are long perplexed by not finding the ſtaff, which is only to be diſcovered by turning the left forefinger upwards; it is then felt at the upper angle of the inciſion, cloſe under the arch of the pubis. Thirdly, the operator ſhould ſeek to lay bare a conſiderable part of the urethra and proſtate gland, before he preſumes to make that inciſion in the urethra which is to admit the beak of the gorget, and therefore, in operating with the gorget, he ſhould diſſect the parts as completely as if his deſign were to operate with the knife. Fourthly, he muſt remember that the hollow of the pelvis, in which theſe parts lie, is very deep, and is, in a luſty perſon, filled with much fat and cellular ſubſtance; that after opening the ſkin and cutting the perinæal muſcles, after the forefinger of the left hand is admitted very deep into the hollow, under the tuber iſchii, there is ſtill an important part of the diſſection to perform,

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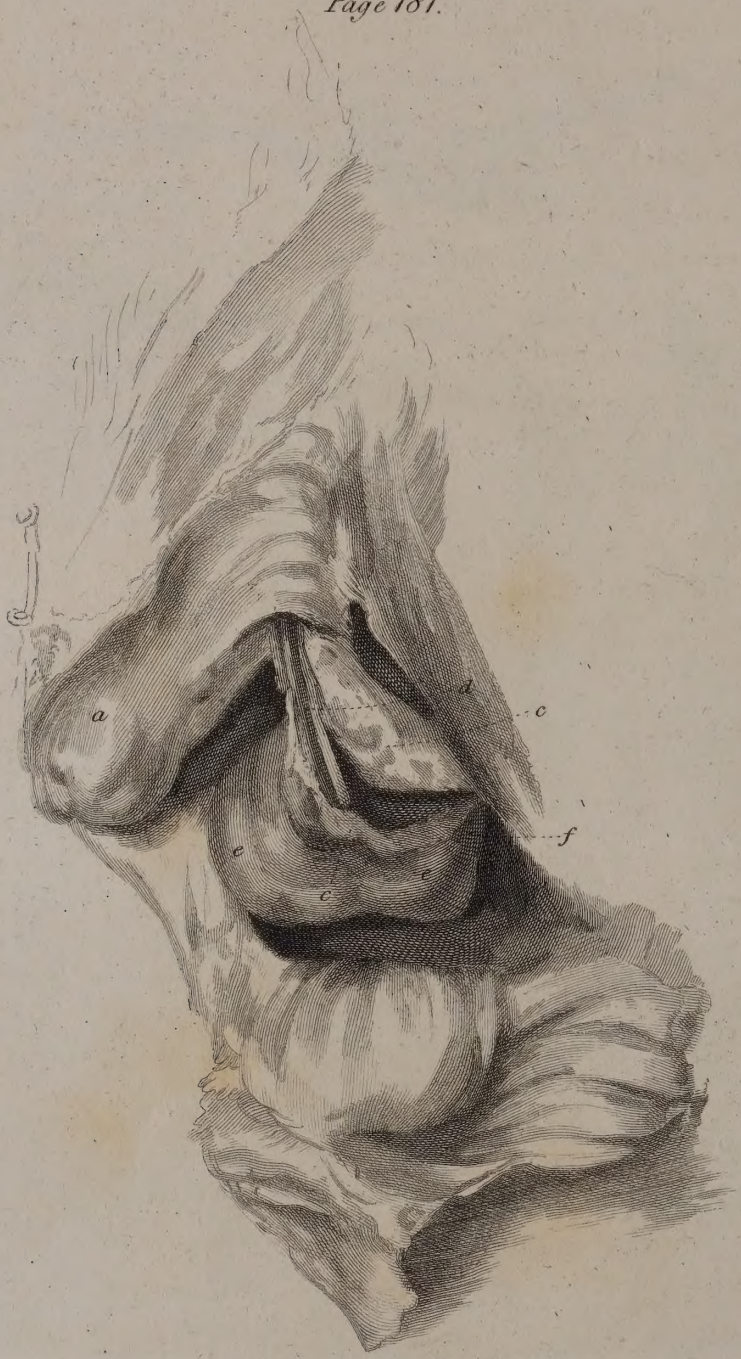

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viz. the diſſection of the levator: for the levator ani ſo covers all thoſe parts, that unleſs it be fairly diſſected, the proſtate gland cannot be diſtinctly felt, and unleſs it be diſtinctly felt, and the membranous part of the urethra laid quite naked, it is impoſſible to make a clean and neat inciſion into it, for admitting the beak of the gorget. If the levator is left imperfectly diſſected, the fibres of the muſcle are apt to cloſe over the ſlit made in the urethra, and prevent the beak of the gorget being fairly admitted into the groove of the ſtaff; it is to this I attribute the accident of the operator often miſſing that inciſion of the urethra which he thought he had made ſo freely. The diſſecting of the urethra and gland very clean prevents all ill conſequences, and never can do harm. The young ſurgeon will alſo remark, in this drawing, the pudic artery, where it runs along under the arch of the pubis, marked (t), and will be ſenſible of the great danger of uſing a broad-bladed gorget, or cutting with Le Cat's or Frere Coſme's knives.

Plate 7. Preſents the parts, with little variety, nearly in the ſame poſture; the urethra, and eſpecially the bulb of the urethra, drawn more aſide; and the moſt intereſting and critical ſtroke of the operation, viz. the cut in the urethra, repreſented. The tuber iſchii (a), the muſcle of the thigh, the biceps (b), the erector penis (c), the accelerator urinæ (d), the arch of the pubis (e), the pudic artery (f), are nearly the ſame as in the laſt drawing.—The view of the parts in the perinæum, and within the pelvis, differs in theſe reſpects. The accelerator urinæ (d) is more completely diſſected away from the bulb of the urethra. The bulb is drawn, by its faſcia and cellular ſubſtance, to one ſide, and pinned down at (g), ſo as to expoſe the membranous part of the urethra. The levator ani (h) is diſſected away from its origin in the pelvis, and ſo turned down as to uncover the proſtate gland (i), and the veſiculæ ſeminales (k k). The ſlit or opening made by the knife in the membranous part of the urethra is marked (l); it is by this ſlit that the beak of the gorget is admitted to the groove of the ſtaff. I have formerly argued the propriety, but this drawing proves the neceſſity, of cutting through the gland to reach the cavity of the bladder, and the difficulty of cutting into the bladder beyond it.

Plate 8. Is the laſt ſtage of this diſſection; it is a ſketch of the proſtate gland as opened by the puſh of the gorget, the laſt and moſt momentous ſtroke of the modern operation of cutting for the ſtone.

The bulb of the urethra (a) is ſtill more held aſide to expoſe the parts. The membranous part of the urethra (b) is ſeen as ſlit up by the knife; the ſide of

the gland, at (c), is ſeen opened by the inciſion of the urethra, being continued through the gland, by the edge of the gorget, which cuts laterally; the groove of the ſtaff which conducts the gorget, is marked (d); the lower bulgings of the gland are marked (e e); that part of the ſide of the gland which is left entire, is marked (f). That the ſide of the gland ſhould be left thus entire in a body which I had cut with a gorget much broader than I ſhould adventure to uſe, is very diſcouraging: Whether the wound made by the broadeſt gorget is really inadequate to the extraction of the ſtone, muſt be proved by more correct ſketches of diſſections made with the honeſt purpoſe of aſcertaining this important fact, yet even in this drawing, it plainly appears that one third of the ſubſtance of the gland remains undivided, and that the opening is hardly equal to the admiſſion of a large forceps.

The two Sketches or etched Drawings, No. 9. and No. 10. ſhow the Extent and Form of the Inciſion made in the Neck of the Bladder and Proſtate Gland, by a broad Gorget.

Plate 9. Is a drawing of the parts cut out from the pelvis. The parts are ſo laid upon the diſſecting board as to ſhow the inciſion of the proſtate from the outſide. The penis is much wrinkled; the bladder falls behind the rectum, and nothing is ſo diſtinctly ſeen as the inciſion of the proſtate, which makes the central part of the drawing; (a) marks the penis; (b) the ſkin, fat, and hair, of the pubis; (c) the ſcrotum and teſticles; (d) the crus penis, held up by a thread; (e) the body of the urethra above the perinæum; (f) the bulbous part of the urethra which lies in the perinæum, covered with its accelerator muſcle (g): The pendulous part of the bulb, which covers the membranous part of the urethra, is marked (h); the membranous part of the urethra, ſlit up by the knife, lies partly behind the bulb, but partly in view, at (i); the opening in the body of the gland, made by the lateral inciſion of the gorget, is marked (k); and this opening gapes with protruding lips from the thickneſs of the ſubſtance of the gland. That part of the body of the gland, which was left uncut by the gorget, is marked (l); the veſiculæ (m m) lie under the maſs of the gland, out of the way of harm, from the lateral cut of the gorget. The pudic artery (n), running curling along towards the crus penis, lies along the ſide of the gland, and too near it, not to be in danger from a broad-bladed gorget; the rectum, where it lies within the pelvis, and on which the veſiculæ, proſtate, and

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lower part of the bladder reſt, is marked (o o); the ſame inteſtine where it is above the peritonæum and within the cavity of the abdomen is marked (p); the levator ani (q) is turned down to uncover the veſiculæ ſeminales and proſtate.

The great internal iliac artery, which lies by the ſide of the rectum and diſpatches the ſciadic branches (r), to the back of the pelvis, and the pudic artery (n), to the parts of generation, is alſo ſeen in this drawing, and is marked (l), where the trunk divides into thoſe ſciadic and pudic branches.

Theſe are, I believe, the chief points in this view of the parts. The concluſions which, I think, we cannot avoid drawing from this view are theſe, that in operating with the gorget, you are, in addition to the accidents which are to be dreaded from ſo unguarded and violent a plunge, expoſed to two imminent dangers, —of a wound inadequate to the extraction of the ſtone, if your blade be narrow, and if broad, to a fatal hæmorhagy! Firſt, it is obvious that but two thirds of the gland are cut even by the broadeſt gorget: that the opening here repreſented will difficultly admit even the forceps: that whatever remains uncut of the gland, muſt be lacerated in extracting the ſtone: that every lithotomy performed with the gorget, while it is delayed till this reſiſtance is overcome by laceration, is accompanied with a contuſion of the parts. I cannot therefore but diſapprove of the opinion of thoſe who repeat this idle expreſſion of Le Cat's, (an expreſſion which was, in his mouth, but an apology for his very partial inciſion of the gland, his debridement du col de la veſſie,) that, even a ſmall part of the proſtate being ſlit up, the reſt will tear. We know by the opinions of the beſt ſurgeons, Deaſe and Camper, how ſlowly it tears, and with how much pain and danger.

Secondly, It may be aſked, ſince our common gorget makes an inadequate inciſion, may we not give ſufficient breadth to the cutting blade to divide the whole gland? No! the line of the pudic artery deſigned in this drawing, and marked (n), ſhows the danger of ſuch a project. We muſt, if we perſiſt in uſing the gorget, be contented with a narrow blade; for the arteries which are ſeen taken up, in the time of operating, are thoſe of the perinæum (as drawn in plate 5.). But if this, the pudic artery, be opened, the patient almoſt inevitably dies. Thus we are conſcious of the neceſſity, in uſing the gorget, of making either an imperfect inciſion or a dangerous one.

I have next to obſerve that the effects are nearly the ſame whether we run the common knife or the gorget backwards along the ſtaff; for the gorget is a knife. A priori, a dextrous ſurgeon would ſuppoſe it in his power, in running the knife

backwards along the ſtaff, to give his inciſion what length he pleaſed, to run it through the whole ſubſtance of the gland, or to run it onwards, if he pleaſed, into the body of the bladder! but it is not ſo; and there are two cauſes to which it may be aſcribed,—firſt, the angle at which the knife lies with regard to the ſtaff and neck of the bladder, and, ſecondly, the receding of the gland. Even in opening a common fiſtula or a diſeaſed cyſt, you feel, in a particular manner, the receding of the edge which you mean to cut, and the unfavourable angle at which the knife lies to it. I am ſure I have not allowed myſelf to be deceived by the flaccid ſtate of the parts in the dead body; I am aware that it is ſuch, that no ſurgical operation can be properly repreſented in the dead body. But this is the fact, that in running your knife, or even the gorget, into the bladder, you almoſt miſs your ſtroke. The gland is actually ſo moveable, that, in making your inciſion into the urethra, the moving of the gland backwards and forwards upon the catheter would incline you to imagine you had made a long ſlit, when you have made but a puncture. When you drive a gorget againſt it, it moves backwards; and if the gorget were blunt, the gland would be puſhed away from the urethra; even when you uſe the ſharpeſt knife, the gland recedes, your ſtroke is difficult, and you could not believe, beforehand, how imperfectly you cut the gland. It is, when ſpeaking of the inciſion of the knife, in the hands even of the moſt dextrous ſurgeons, that Camper ſays, "Incredibile eſt quàm parva plaga ab omnibus etiam dexterrimis infligatur." The knife, run onwards into the bladder, makes no freer inciſion than the gorget, and it endangers the rectum, though it does not, like a broad gorget, endanger the pudic artery.

Plate 10. Is the counter part of this drawing it exhibits the ſame opening of the gland, from the inſide of the bladder, which, in plate 9., is ſeen from without; and proves ſtill more decidedly, how inadequate ſuch an inciſion is to the tranſmiſſion of the ſtone graſped in the forceps; (a) the penis, (b) the fat of the pubis, (c) the ſcrotum, and (d) the cut edge of the ſkin, cannot be miſunderſtood. The crus penis is, in this drawing, alſo ſuſpended by the cord (e); the bulb of the urethra (f) is almoſt covered by the cut edges (g) of the bladder. The whole bladder is now cut open and inverted. The general tumor of the proſtate lying under the bladder, is eaſily remarked at the three points (h, i, k); at (k) the bulging of the gland is ſeen more in profile, and, though the bladder is inverted over the maſs of the gland, the form and ſize of the gland appear diſtinctly through the thin and lubricous coats of the bladder. My reader can neither miſtake

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E. Mitchell sculp.t

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the form of the gland, nor the diſproportion betwixt the opening (l) and the general maſs of the gland; for, though it might be miſtaken for the natural orifice of the bladder, it is actually the opening made by the inciſion of a broad gorget.

Plate 11. Diſplays the ſtate of the urethra, proſtate gland, and cervix, cut with the knife, completely, not by running the knife downwards, as Cheſſelden did in his firſt inciſions, but by diſſecting deep, ſlowly, and carefully, and then ſtriking the knife through the poſterior part of the gland into the groove of the catheter, and drawing it forwards from the back part of the gland to the membranous part of the urethra.

In this drawing are ſeen, (a) the body of the penis reclined back, and the ſtaff, being in the penis, and reclined back along with it; the point of the ſtaff is of courſe out of the bladder, and is ſeen at (b), projecting from behind the bulb at the point where the wound in the membranous part of the urethra begins: the crus penis is marked (c), the bulb of the urethra is marked (d), the anus ſurrounded by its cellular ſubſtance is marked (e), the external wound for the operation of lithotomy is marked (f), and the circumſtances of the internal wound, i. e. the inciſion of the urethra and proſtate, expreſſed in this ſketch, are as follows:

1ſt, A ligature is ſtruck into the upper part of the proſtate gland, by that it is pulled ſtrongly upwards, which ſtretches the cut urethra, and opens the lips of the divided gland. 2dly, The membranous part of the urethra, about an inch and a half in length, is ſlit up entirely, and lies now ſo expanded in conſequence of the diſſection of the parts neceſſary to ſhow the wound of the gland, that it is difficult to imagine how its edges could unite, or it could, in the actual operation, become a canal again. 3dly, The gland being fairly ſlit up by the knife, its upper part (g) continues circular, retaining the form of a gland, but the cut face of the gland is ſeen at (3), and this ſo diſplays the ſubſtance of the gland, that the mucous ducts (3, 3,) are ſeen running along in the heart of the gland, towards the ſide of the caput galinaginis, marked (4), where, as formerly deſcribed, the ducts of the gland open by ſix or ſeven very diſtinct mouths. The opening of the gland is here very ample, the whole body of the gland is cut through back to the body of the bladder; the back part of the gland and the body of the bladder being marked (h).

The looſe cellular ſubſtance, among which the proſtate gland and veſiculæ ſeminales lie, is marked by a deep ſhadow. The bladder, in a flaccid ſtate, is held up and turned ſomewhat to one ſide by the ligature (i): the left ſeminal veſicle and its duct, running up along the back of the bladder, is marked (k k); the right

veſicula ſeminalis, lying more under ſhadow, and hardly ſeen, is marked (l); the inteſtinum rectum is marked (m m), the probe (n) is paſſed through the wound of the integuments and muſcles.

Plate 12. Makes the demonſtration complete, it ſhows the bladder opened, and ſpread out over the rectum; even the convolutions of the veſiculæ ſeminales (a a) are marked through the thin and lubricous coats of the bladder, and the two puncta or openings (b b), where the ureters enter near the neck of the bladder, are ſeen. The external wound of the integuments (c) is here ſeen again, the wound of the gland (d) is alſo ſeen from the outſide, but the two cut faces of the gland are now neatly applied to each other. The membranous part of the urethra is alſo ſeen here, and need not be marked; but leſs of the wound is ſeen from without, that it may be more diſtinctly ſeen from within; and the wound within the bladder, marked (e e), is plainly ſufficient for the eaſy admiſſion of the forceps, or extraction of the ſtone; the wound of lithotomy I thus find, when made freely with the knife, goes entirely through the gland, beginning juſt above the mouth of the ureter, and terminating in the membranous part of the urethra.

I conclude the preſent leſſon in practical anatomy with this perſuaſion and hope, that, though thoſe who now operate will continue to uſe the gorget, thoſe who are educating for our profeſſion will ſtudy anatomy, and learn to operate with the knife. The demonſtrations I have given of this piece of anatomy are in every ſenſe important, and each ſtep of the demonſtration has brought us nearer to the ſolution of the important problem,—"Whether we ſhould operate with the knife or with the gorget?" The deciſion I leave with my reader: my ſole remaining duty is now reduced within a narrow compaſs; it is to lay down for him plain directions for performing whichever of theſe operations he may prefer.

OF THE MANNER OF OPERATING WITH THE SHARP GORGET.

Accuſtomed with teaching, I have had occaſion to obſerve that the mind of the ſurgeon is ill at eaſe, who has to perform an operation for which he has no theory; he muſt operate with little deciſion who merely imitates the motions of others. I have therefore been at pains to teach my reader, by plans and ſketches of the parts, to reflect on the conſequences of his inciſions, to mark the deſign of each ſtroke of the knife, to perform each movement, not by imitating the motions of

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others, but with intelligence and a fixed and determined purpoſe; the being thoroughly acquainted with the projects and operations of others is, to the ſurgeon, the ſureſt means of underſtanding that which he is actually to perform. Thus far do I naturally wiſh to apologize to my reader for the tedious taſk I have appointed him, of conſidering and ſtudying maturely every operation before he preſumes to perform one; this is my ſole reaſon for undertaking, as I have done, the wearieſome and diſguſting taſk of deciding queſtions long ſince forgotten, and proving truths which will be ſo eaſily acknowledged.

I have alſo obſerved that, to perform an operation like this with an intrepid ſpirit and ſteady hand, the mind of the young ſurgeon muſt be compoſed; he muſt have an entire and perfect confidence in his own knowledge; he muſt be familiar with the ſtructure of the parts; he muſt ſee them expoſed in every variety of poſture, and muſt have their relations to each other explained: He muſt diſſect them often to make this knowledge familiar, and to acquire dexterity and addreſs, for no operation in ſurgery can be ſo properly defined a *diſſection* performed on the living body as this. While the young ſurgeon ſtudies the connections and relations of theſe parts, he muſt alſo be inſtructed in all the accidents which may occur; he muſt be taught to foreſee every poſſible difficulty, that he may not in the midſt of an operation be overcome with the ſudden apprehenſion of ſome interruption which he does not underſtand. The teacher who is to deſcribe ſo eventful an operation as this of lithotomy, muſt firſt explain in detail, circumſtantially and ſeparately, each important movement of the hand or inſtruments, and every precaution with which each is to be accompliſhed; and then cloſe his leſſon with ſuch a rapid enumeration and deſcription of the ſucceſſive acts, as will leave a vivid impreſſion on the mind of the young ſurgeon of the manner in which he is to proceed. This laſt deſcription ſhould ſerve him as a dramatic picture of what he is to perform, which he may look upon anew every time he has to operate.

Before I proceed to deſcribe the ſeveral ſtages of the operation of lithotomy, there are ſome preliminary points to be explained, which relate not to the dreſs of the patient nor the height of the table, but to the main deſign of the operation, and eſpecially to the poſture of thoſe very moveable parts, the rectum and bladder, with regard to each other, and the manner in which the ſurgeon ſhould feel and aſcertain every thing that is intereſting to him. The kind and degree of diſtreſs which your patient ſuffers, will enable you to gueſs at the ſtate of the parts; in a boy who cannot have paſſed many years in this condition, whoſe parents, from obſerving his pulling

out the penis and preſſing the thighs, and crying when paſſing the urine, can aſcertain both the duration of his complaints, and the degree in which his health is affected, you are ſure of every thing favourable for your operation; for boys are naturally healthy; the ſtone has not with them time to acquire any uncommon ſize, it uſually is ſmall like a gall-nut, and very rough and irregular on its ſurface; the bladder is not contracted nor ulcerated; you can feel the ſtone with the fingers, in the rectum, and preſs it forward ſo as to make it prominent in the perinæum; in a healthy boy with a ſmall ſtone recently formed, you undertake the operation with confidence, and probably would chooſe to cut upon the gripe.—In an adult who retains much urine, and paſſes it freely, who, though the ſymptoms of ſtone are deciſive, yet paſſes long intervals with little pain, in whoſe urine there is not great ſediment of mucus, and ſeldom any blood, with whom the paroxyſms of the diſeaſe, i. e. the temporary inflamed and irritated ſtate of the bladder, is not frequent; the bladder is probably capacious, the ſtone ſmall, and the ſtate of the parts moſt favourable for operating.—But the ſcene is ſadly reverſed when the patient, ſhrinking from the pains of the operation, has long endured the tortures of the ſtone: When he has endured this diſorder for many years, he is pale, languid, and emaciated; the parts are unfavourable to the operation, and his conſtitution to recovery: he can retain but one or two ounces of urine: the bladder is, by its frequent contractions, thickened in its coats, and, its inner and moſt delicate ſurface being in almoſt continual contact with the ſtone, he feels excruciating pains in the gland penis every time he paſſes his urine: when he walks, he has a gravitating and dragging feeling, accompanied with teneſmus or diarrhæa, from the increaſing ſize of the ſtone, by which his paroxyſms of particular diſtreſs are frequently renewed; his urine is ſo mixed with mucus, that, of the quantity which he paſſes into a glaſs for our inſpection, the urine being poured off, one half remains a pure white mucus, and each paroxyſm of pain, eſpecially if it ariſe from walking, is accompanied with a diſcharge of blood: the day he paſſes in almoſt unremitting torture, and, during the night, he is every half-hour on his knees, ſtraining to paſs his urine with dreadful pain. In ſuch a patient the bladder is ſmall, contracted, ſubject to inflammation; from frequent paroxyſms of the ſtone, the parts are in a ſtate ſometimes peculiarly diſpoſed to inflammation, and never favourable to the operation, while the ſtrength and conſtitution are exhauſted by ſuffering and want of reſt.

It is only when your patient is free from pain, when he has reſted, and is refreſhed, after the fatigues of the journey that has brought him to town, when he has

had a long interval after a paroxyſm of pain, when he is free from irritation and fever, and in no danger from the infection of any reigning epidemic, that you can venture to perform the operation. You do not wait, as formerly they did, for the more favourable ſeaſons of ſpring or autumn; theſe ſeaſons it was natural to prefer in France and Germany, where the winters are ſevere and the ſummers ſultry and oppreſſive: in this country you have no other cares than to nouriſh and ſtrengthen your patient, if exhauſted, and to prepare him ſo by opiates and the warm bath, as to enſure a favourable ſtate of the bowels and ſkin. The ſeaſon of any epidemic diſeaſe is much to be avoided. I have frequently, during the prevalence of influenza or of dyſenteric diſeaſes, been cruelly diſappointed in the adheſion of wounds after common operations, in caſes of the moſt ſimple inciſions, as in the extirpation of a cancerous breaſt; but the inflammation, which merely prevents adheſion and retards the cure in common operations, produces in this, where the wound is ſo near the viſcera, abdominal inflammation and death.

And let me adviſe the ſurgeon to be ſlow in pronouncing his opinion, to be careful to aſcertain the exiſtence of the ſtone, by ſounding, and to feel it alſo by introducing the fingers into the rectum, and to eſtabliſh and authenticate his own opinion by a regular conſultation, before he preſume to operate. He ſhould almoſt live with his patient for ſome days, for, unleſs he inquire carefully into his hiſtory, he cannot proceed with confidence, or his confidence may draw him into dreadful errors. The patient may have no ſtone, but an ulcerated and thickened bladder; he may have a ſtone, but too ſmall to require ſo dreadful an operation, one which the patient might be able to engage in the urethra, and paſs naturally by drinking floods of diluents, and paſſing the urine upon his knees; a ſmall ſtone, being impelled by the force of the urine into the urethra, ſometimes forms there a ſac for itſelf, and the ſound grating along this ſmall calculus, in paſſing along the urethra, perſuades the ſurgeon of the exiſtence of a ſtone in the bladder: a patient has been unfortunately cut for a ſtone ſo ſmall, that it has been ſwept out along the channel of the gorget with the flood of urine, and none been found to ſeize with the forceps; at other times a ſmall calculus, of a cherry-ſtone ſize, has been found in the hinge of the forceps, and ſuch accidents have been mentioned with as much indifference as if the ſurgeon were not reſponſible for the cruelty and folly of thruſting a gorget into the bladder of a patient whoſe ſtone was ſo ſmall as to be paſſed by the urethra. In ſhort, theſe are accidents which nothing but uncommon precaution and a moſt faithful attention to the complaints, feelings, and whole hiſtory of the patient, can detect or prevent.

However diſtinctly the ſound may plump upon the ſtone, and ſatisfy every one of its exiſtence, the ſurgeon never is to omit introducing one or two fingers into the rectum; from this mode of inquiry, various circumſtances may be diſcovered, and ineſtimable advantages ariſe to the ſurgeon, who, in place of imitating the motions of other operators, proceeds with intelligence and deſign. I hold this mode of examination to be little leſs important to the operator who cuts with the knife or gorget, than to him who cuts on the gripe: By introducing two fingers into the rectum he feels the ſtaff diſtinctly, upon which he is to perform the moſt delicate part of his inciſion: he feels the poſition of the rectum, which he is to keep out of the way of his inſtruments: he diſtinguiſhes, through the walls of the rectum, the membranous part of the urethra, which is to be his aim if he cut with the gorget, and the proſtate gland, which he is to divide, if he cuts with the knife: he feels the manner in which the ſtone lies in the bladder, which, after his inciſions, he is to graſp with the forceps: if the ſtone be ſmall, he may not feel it very diſtinctly; but if it be large, it falls low towards the neck of the bladder, is eaſily felt, its very form may almoſt be diſtinguiſhed, the ſtaff being plainly felt paſſing under the ſtone, when large, and holding it in its bend or curvature. The ſurgeon, by occaſional examinations, may almoſt eſtimate its ſize, and, if he do not expreſsly proportion his inciſion to its ſize, may at leaſt avoid the error of making a great inciſion for a ſmall ſtone, or the ſtill greater danger of making a ſmall inciſion when the ſtone is very large; and when the ſtone is ſo large as to require to be broken by ſtrong forceps, he may always be aware of the nature of the operation he is to perform. I remember to have been called to a conſultation, in which the gentleman, who invited the conſulting ſurgeons, wrote in theſe terms: "To conſult upon the caſe of a patient who has a ſtone in the urethra, and another in the bladder." The patient, in fact, had laboured long under the diſeaſe, the ſtone had increaſed to an enormous ſize: upon paſſing the ſound, it encountered the ſtone almoſt before it had entered the bladder, ſo low was the ſtone depreſſed by its own weight, and the patient's ſtraining dilating in ſome degree the neck of the bladder and projecting into it. Upon examining by the rectum, I felt a ſtone nearly the ſize of the fiſt, and intreated the ſurgeon to have ſtrong forceps in readineſs to break it in caſe of difficulty. When we were met for operation, I uſed the freedom of aſking, "Whether forceps were at hand to break the ſtone?" He ſaid, "No; that he had ſent for forceps ſuch as I wiſhed, but could not eaſily procure them." Then I ſaid, "Sir, if you value your own reputation, or your patient's life, refrain from operating till you are better provided, which you may eaſily be

to-morrow morning; to perform this operation in the ordinary way, will be murder." He turned about and proceeded with his operation: the ſcene which enſued was dreadful; two or three forceps were ſucceſſively twiſted, or broken; all preſent were in the moſt diſtreſſing perplexity. Mr. Wood bethought himſelf of a pair of large and ſtrong forceps, which had lain as lumber among his apparatus; theſe were ſent for to his houſe, and with them the ſtone was extracted; but the operator had never one moment refrained from labouring with one inſtrument or another; the patient had ſtruggled under his hands a full hour, in the moſt dreadful agonies; I need hardly ſay, that in two days he died *.

Not to break the ſtone, when of ſo uncommon a ſize, is cruel and dangerous, and no one accuſtomed with this operation will ſcruple to do ſo for fear of fragments of the ſtone remaining in the bladder, for he muſt be conſcious that he ſeldom operates without the forceps chipping off ſmall fragments of the ſtone, which are more dangerous than the fragments of a ſtone deſignedly broken, as they are leſs obſerved.

The condition of the rectum and bladder ſhould be an object of particular attention. The bowels muſt be emptied by a purge two days before operating, for fullneſs and irritation of the bowels will diſpoſe to abdominal inflammation. The rectum muſt be emptied by a glyſter on the morning of the operation, leſt the fulneſs of the gut ſhould expoſe it to be wounded: This if not a fatal is yet a blundering wound, of which the ſurgeon ſhould be much aſhamed: although, we have the beſt authority for affirming that the inteſtine may be wounded by the moſt dextrous operator; Cheſſelden acknowledged to Mr. Morand, that he had twice, in operating, wounded the rectum. As it is chiefly important to prevent the cutting edge of the gorget injuring the back part of the bladder, it is of the firſt importance, in operating with the gorget, to have the bladder full; the fullneſs of the bladder allows the ſtaff to be turned eaſily to every ſide of the bladder, in feeling for the ſtone; it allows the ſurgeon to ſet the ſtaff before cutting, in the preciſe direction that he wiſhes to have it. The fullneſs of the bladder preſents the fore part of its body viz. that where the proſtate ſurrounds it, fairly to the cutting edge of the gorget, and gives the bladder a ſteadineſs to reſiſt the puſh. This fullneſs of the bladder prevents the cutting gorget being driven through the fundus among the bowels, and the quantity of urine running off freely along the channel or hollow of the

* I have preſerved this ſtone.

gorget indicates to the operator, that this, the moſt dangerous movement in the operation, is properly performed. The patient for this end muſt retain his urine during four or five hours in the morning of operation; in boys, and even in men, a linen rag muſt be tied round the penis to prevent the urine flowing off. The ſtring muſt not be undone upon introducing the ſtaff for operation, for the body of the penis is ſo compreſſible, that the ſtaff paſſes as eaſily when the ſtring is left, as when it is taken away. I have often been provoked to ſee the ſtring taken off, the ſtaff introduced, and the whole of the urine allowed to run off by the groove of the ſtaff, in the very moment in which the ſurgeon is about to drive his gorget into the bladder!

Foubert, in performing his operation, depended more entirely upon the diſtenſion of the bladder, than thoſe who operate with the gorget, for, without its being full, he was in danger of miſſing the ſtroke with his trocar; once, in operating, he found that not one drop of urine flowed upon ſtriking in the trocar; he believed that he had actually miſſed the bladder, but he found, upon inquiry, that the man, being impatient of retaining his urine, ſlipped behind the ſkreen while Foubert (for it was in the hoſpital) was operating upon another patient, undid the ſtring with which the penis was tied, and piſſed luſtily, and then deliberately tied the ſtring about his penis, came forward and preſented himſelf for operation: Had Foubert been aware of what had paſſed, he muſt have delayed the operation till the following day.

As one great purpoſe of many things which the ſurgeon does immediately previous to the operation, is to aſcertain the relative poſture of the parts, and revive his own recollections of the ſeveral points, he ſhould never fail to introduce the ſtaff himſelf, though often this is committed to the aſſiſtant. May not an unſkilful aſſiſtant drive the point of the ſtaff through the membranous part of the urethra, and lodge it between the rectum and bladder, where, of courſe, the gorget when driven along will follow the groove? Is it not a ſatisfaction to the ſurgeon to paſs the ſtaff himſelf, that he may do it gently without irritating the parts; that he may feel and diſtinguiſh any rub from any ſmall calculus, ſticking in the urethra; that he may lodge fairly in the bladder that grooved directory, which is to guide the moſt important ſtroke of his knife; that he may plump his ſtaff againſt the ſtone, and feel it diſtinctly before he operate; that he may, after introducing the ſtaff, paſs his finger into the rectum, feel how the ſtaff lies, incline the handle of it to the right groin, and ſo protrude the heel in the perinæum where he is to cut?

Will not the introducing and ſetting the ſtaff and feeling its curvature, both in the perinæum and from within, give the operator more deciſion, and a more diſtinct recollection of what he has next to perform? To deliver the ſtaff to the aſſiſtant, that he may introduce it, is a ſlovenly, a timid, or an evaſive practice; I have ſeen this often done, but it always ſeemed to me that the man who dared to undertake the operation of lithotomy, was doubtful whether he could introduce a ſtaff; or that he was ſo jealous of his reputation as a rapid operator, that he would not allow the more ignorant of the attendants to calculate the operation as begun, when he was only introducing the ſtaff; or perhaps he feared leſt his hand ſhould be unſteadied by ſome ſlight oppoſition to the introduction of the ſtaff! a part of the operation which ſhould, in fact, by reminding him of all the important relations of the parts, inſpire him with ſteadineſs and manly reſolution.

There is a gradation in the length and curvature of the inſtruments which are on various occaſions to be introduced into the bladder. The CATHETER, as it needs not enter far into the neck of the bladder, though it ſhould always be as big as the urethra will eaſily admit, ſhould not be long, and ſhould have a very gentle and ſimple curve: The SOUND, with which we feel for the ſtone, muſt be round, ſmooth, longer, and more curved; but it muſt not be very long nor much curved, leſt it do not turn eaſily from ſide to ſide in the bladder; and it ſhould be introduced when the bladder is moderately full, that it may be turned eaſily in various directions in ſearch of the ſtone, which, if it be not found when the bladder is full, or the patient ſeated, or lying on the ground, may perhaps be felt after he has been permitted to empty the bladder, or allowed to ſtand up: The STAFF, or grooved ſound, with which the ſurgeon means to operate, by cutting upon it with the knife after the manner of Raw or Cheſſelden, muſt be big, muſt have an acute angle at the place where it turns at the entrance of the bladder, and muſt be protracted beyond this angle into a long and ſtraight beak, that it may be diſtinctly felt in the bladder; and its groove muſt be large and round-lipped, that it may be eaſily diſtinguiſhed, and may guide the inciſion-knife or lithotome fairly: But the ſtaff along which the ſurgeon deſigns to run the ſharp gorget,—though it ſhould have the ſame ſudden angle or prominent heel, that it may be eaſily felt through the membranous part of the urethra,—though it ſhould have the ſame wide groove, but with lips leſs obtuſe or round,—ſhould not be protracted into ſo long a beak, leſt it ſhould hold the knob of the gorget too long engaged in the groove, and carry it ſo deep as to endanger the fundus of the bladder.

The poſture in which the patient is bound, is horrible, moſt oppreſſive, but yet it is eſſential to the performing of an operation, where the ſlipping of one inſtrument, or the miſgiving of one ſtroke of the knife, makes the difference—of ſafety or death. He muſt be made to graſp his feet with his hands, and ſecured in that poſture by ſtrong garters, encircling the wriſts and ancles, and thus, bended into a curve, he reſts almoſt upon one point of the ſpine, and is brought ſo near to the edge of the table, that he is almoſt ſuſpended in air, by the two lateral aſſiſtants who ſupport each a foot and arm. Unleſs the patient is brought thus far over the edge of the table, ſupported by the aſſiſtants, and his breech bolſtered up by a pillow; unleſs his breech project over the edge of the table; unleſs the perinæum be turned almoſt directly upwards, and the ſurgeon ſeated low and rather under his patient, he cannot purſue his inciſion ſo far beyond the tuber iſchii as he ſhould do in order to cut the tranſverſe muſcle, for the inciſion ſhould paſs the curvature of the hip, as will be ſeen in the firſt drawing on the ſheet of plans appropriated to the operation with the gorget.

The patient ſhould be brought out for operation, dreſſed in a looſe gown, ſtockings, and ſlippers: his neck-cloth ſhould be looſened, or a light ſilk handkerchief put about in place of it: three medical aſſiſtants ſhould ſupport him, one on each ſide ſhould hold, each, a leg and wriſt, ſupporting the ſole of the foot in the hollow of one hand; the third aſſiſtant ſhould ſupport his head and ſhoulders, and keep him forward according to the operator's directions. The table ſhould be big, firm, and ſteady, covered with a folded blanket, with one or two ſmall pillows placed for the head to reſt upon, and one longer and bigger to ſupport the breech, or rather the loins; a little ſand ſhould be ſtrewed under the lower end of the table. A friend ſhould ſtand by to ſpeak to him, to encourage and ſupport him, and to give him occaſionally a little wine and water; and, as no unſeemly confuſion ſhould be allowed, every thing on the table of inſtruments ſhould be fairly arranged, and every attendant ſteady, ſilent, and obſerving. One only ſhould hand the inſtruments; while the aſſiſtant ſurgeon, taking his place behind the young man who ſupports the right foot, waits there till the ſurgeon, having introduced the ſtaff, and felt and placed it, lays it down towards the right groin, and gives it to him in charge; when he is to graſp it firm and hold it ſteady with his right hand, but without preſſing hard, ſupporting the teſticles and ſcrotum with the flat palm of his left hand, and pulling ſlightly upon them ſo as to ſtretch the perinæum and make it tenſe for the inciſion.

Upon the table are placed, a decanter of wine, another of cold water, and a large glaſs of cool wine and water, which may be poured into a ſmall tea-pot, as more convenient for the patient in the awkward poſture in which he lies; a baſin of warm water, with the forceps and ſcoops in it; and in this baſin of water the ſurgeon heats the ſtaff with which he chooſes to operate. The ſtaff he chooſes, and the gorget ſuited to the ſize of the patient, and well and ſmoothly fitted to the groove of the ſtaff, and the knife with which he is to cut, are laid on a plate upon a fine cloth or towel. Theſe inſtruments lie on the plate; the ſtaffs and forceps and ſcoops are placed in the baſin of hot water; the ſponge, for wiping the wound, in another baſin of warm water: The needles, the lint, the dry ſponges, or agaric, to be uſed in caſes of unuſual hæmorrhagy, together with the canula, round which the ſponge or lint is to be wrapped in caſe it ſhould be neceſſary to thruſt a canula into the wound, lie behind the baſins and apart; and along with theſe is to be laid, in another baſin of warm water, a ſtrong ſyringe, or a large glyſter bag and pipe, for waſhing out any ſmall calculi or fragments of a broken ſtone.—When the ſurgeon, advancing to the table, thus arranged, warms the gorget, and then ſticks it in his girdle or apron ſtring; warms the ſtaff and oils it, with the purpoſe of introducing it; twiſts a towel into his girdle, for it is impoſſible to perform the ſeveral parts of an operation neatly, with ſoiled hands; and leaves upon the plate only the inciſion-knife, which his aſſiſtant hands him, upon receiving the ſign; and ſometimes alſo the gorget is left to be handed by the aſſiſtant.

The operation of lithotomy, as performed with the gorget, may be divided into theſe ſtages: 1ſt, The external inciſion, by which we divide the ſkin and the tranſverſe muſcle of the perinæum: 2dly, The internal diſſection, by which we divide the fat and cellular ſubſtance, and the fibres of the levator ani muſcle, and open the urethra: 3dly, The ſettling of the gorget in the groove of the ſtaff, and puſhing it onwards through the proſtate gland: 4thly, The introducing the forceps withdrawing the gorget, and graſping and extracting the ſtone.

OF THE EXTERNAL INCISION.

The general belief and the common deſcription ſtands thus: "That you are to make your ſtaff protrude in the perinæum, and to perform your external inciſion, by cutting upon the ſtaff."

Nothing is more untrue; we cut far from the ſtaff: and this unfortunate deſcription occaſions infinite perplexity to the young ſurgeon, who, in ſetting his ſtaff, cannot make it be felt in that place where he muſt perform his inciſion, and who, having made his inciſion, and penetrated to a conſiderable depth without feeling the ſtaff, continues in confuſion and diſmay.

In the ſheet of drawings which are to illuſtrate the operation with the gorget, there are ſeveral plans which will ſerve to correct this miſtake. The external inciſion relates not at all to the neck of the bladder, nor is it made upon the curve of the ſtaff. The ſtaff can by no force be made to project in the perinæum lower than the point (a), figures firſt and ſecond. The external inciſion relates not to the curve of the ſtaff, but to the great hollow betwixt the rectum and tuber iſchii; it is deſigned merely to open the way into this hollow, through which the ſtone is to be extracted; and the ſurgeon's chief care muſt be, after cutting through the ſkin and fat, to divide the tranſverſalis perinæi muſcle, and all the ligamentous fibres, which would, if left undivided, oppoſe the extraction of the ſtone. The inciſion begins at that point, an inch below the ſcrotum, where the heel of the ſtaff is felt, and, departing from that point and leaving the direction of the ſtaff, it paſſes over the great hollow in a line betwixt the anus and tuber iſchii; the inciſion is performed in the following manner:—The ſurgeon ſeats himſelf on a low ſtool; the aſſiſtant draws the teſticles upwards, to make the perinæum tenſe, and gives a ſlight preſſure to the ſtaff; the operator then lays his left hand flat over the right buttock of the patient, ſo that the palm of the hand lies upon the tuber iſchii; ſpreads out his fingers upon the perinæum, as in the poſture of diſplaying a ring; by preſſing firſt two or three times with the point of the fore-finger at the root of the ſcrotum, he feels the heel of the ſtaff; and then, by drawing the ſkin of the perinæum towards the left ſide with the points of the fingers, he makes the lurk betwixt the perinæum and the hip, even. Then, taking the knife (which ſometimes, while ſtretching the perinæum, the ſurgeon holds in his mouth) in his right hand, he holds it lightly like a writing-pen, with the points of the thumb and three fingers; begins the inciſion about an inch (in a big man) behind the ſcrotum, and carries it downwards, declining regularly towards the hip, till it terminates apparently upon the hip, for though the inciſion is carried regularly in the middle betwixt the anus and tuber iſchii, yet, the ſkin being tenſer to the ſide of the tuber iſchii, the wound ſeems to decline towards that ſide. The extent of the wound being aſcertained and marked out by this firſt ſtroke of the knife, three inches and a half in length, more

or leſs, according to the bulk of the patient, or the ſize of the ſtone; this inciſion beginning behind the ſcrotum, proceeding obliquely towards the hip, running in the middle betwixt the anus and tuber iſchii, or holding off but a little from the anus for fear of wounding the rectum, will be found to have its centre nearly oppoſite to the anus; and if the whole length of the inciſion be three inches and a half, two inches of its length will lie before the anus, and one inch and a half behind. The fingers of the left hand, which at firſt kept the ſkin tenſe, are now withdrawn for a better uſe. The fore-finger now guides the knife, and the operator proceeds to diſſect through fat and cellular ſubſtance, and muſcular and ligamentous fibres, till the wound is free and open, till all ſenſe of ſtricture is gone; for it is only by feeling oppoſition and ſtricture that we recognize the tranſverſe muſcle: When this hollow is fairly laid open, the external inciſion, *which relates merely to the free extraction of the ſtone, is completed*; and the operator begins to feel for the ſtaff.

OF CUTTING THE URETHRA.

The inciſion thus made is into the hollow of the pelvis below the place of the ſtaff, which is only to be felt (at (a) figures firſt and ſecond) in the upper angle of the wound. If it were his deſign to operate only with the knife, the ſurgeon would now puſh his fingers deep into the wound, and, by the help of the fore-finger, diſſect from the urethra along the body of the gland, till he diſtinguiſhed its thickneſs and ſolidity, and reached the back part of the gland; then plunging his knife through the back of the gland, and ſettling it in the groove of the ſtaff, he would draw it firmly and ſteadily towards him, preſſing the knife ſteadily into the groove of the ſtaff, and then, the free diſcharge of the urine aſſuring him that the gland and cervix veſicæ were divided, he would lay aſide his knife, paſs the left fore-finger into the bladder, withdraw the ſtaff, and introduce the forceps.

But in operating with the gorget, the next buſineſs after the outward inciſion is to ſeek out, not the body of the proſtate gland, but the membranous part of the urethra; to find it, the operator turns his fore-finger towards the upper angle of the wound; feels for the ſtaff cloſe under the pubis, when it lies cloſe upon the bone, hardly to be diſtinguiſhed from it; and as the operator recognizes the tranſverſalis muſcle only by the feeling of reſiſtance, he recognizes the membranous part of the urethra only

by the nakedneſs of the ſtaff. But it is ſafeſt to be very clear, to diſſect fairly to the ſtaff, to feel not merely the membranous part of the urethra, but the body of the gland. In this ſtage of the diſſection you can do no harm; a fair diſſection may ſave you the diſgrace and danger of making three or four unſucceſsful cuts at the urethra; you therefore keep preſſing down the rectum, with the mid-finger a little crooked; with the fore-finger pointed nearly upwards, you guide the knife in diſſecting along the naked part of the ſtaff, and the body of the gland; and when all is fair, and you are prepared to ſtrike into the urethra, you place your fore-finger upon the apex or point of the proſtate gland; and, turning the edge of your ſcalpel upwards, you ſtrike it firmly through the urethra into the groove of the ſtaff, and draw it towards you, ſteadily, along the groove, till you have made an opening ſuch as you cannot miſs, about half an inch in length, into which you fix the nail of your left fore-finger, or of your thumb, and prepare to introduce the gorget *.

OF INTRODUCING THE GORGET.

Keeping his thumb-nail firmly fixed in the groove, the ſurgeon gives away the knife, and lifts the gorget; poiſes it, and then holds it firmly in his hand. He then paſſes the gorget into the wound, where it enters pretty deep before it reaches the ſtaff; then, pointing the beak of the gorget to the groove of the ſtaff, he lodges it fairly in the groove, and running it once or twice backwards and forwards to be ſure that all is fair, and holding the gorget ſteady with the right hand, and reaching the left hand over the pubis to receive the ſtaff from his aſſiſtant, he lays hold of the handle of the ſtaff, holds it ſteady for a moment, then, moving the gorget with the right hand, feels by the left whether the beak runs fairly and ſmoothly in the groove; then, the two hands acting in concert with each other, the operator balances the ſtaff and gorget, and, by making the two hands feel each other, prepares them for co-operating in the moſt critical moment of driving in the gorget; and

* I intreat thoſe who are not perfectly confident to make their inciſion of the urethra more than half an inch in length; an inciſion of half an inch in length is juſt ſufficient to be diſtinctly felt and to allow the beak of the gorget to be fairly introduced; but it is an inciſion which a ſurgeon unaccuſtomed with operation might loſe, and fall into confuſion. I adviſe him rather to ſlit up nearly the whole length of the membranous part of the urethra, when his inciſion will be nearly an inch in length.

when all is prepared for driving home the gorget into the bladder, the ſurgeon depreſſes the handle of the ſtaff, ſo as to carry the point of it deep into the cavity of the bladder; his ſtaff ſtands, at this moment, at right angles with the patient's body; he riſes from his ſeat, ſtands over the patient, for an inſtant of time, balancing the ſtaff and gorget once more, and, feeling once more that the beak is fairly in the groove, he runs it home into the bladder, pointing it rather upwards, than directly backwards: Then the urine guſhes out; the beak of the gorget goes off from the point of the ſtaff with an audible cluck, and the operator withdraws the ſtaff with the left hand, as the concluſion of that movement with which he drives in the gorget with the right.

OF EXTRACTING THE STONE.

The moment the gorget is driven home, as it always is, up to the hilt, (the thumb of the operator, which lies upon the gorge of the inſtrument, being actually within the wound,) the fundus of the bladder is in danger,—for the horrid and unnatural feeling of being thus impaled excites the patient to preſs downwards, as in paſſing the fæces and urine; the bowels are forced down upon the bladder; the fundus of the bladder is forced, by this preſſure from above, and its own natural contractions, upon the edge of the inſtrument; matters ſtand now in the very dangerous condition repreſented in figures 3. and 4., and the beſt means of preventing harm, is to introduce the forceps quickly! no time ſhould be loſt in the fooliſh ceremony of introducing the fore-finger to feel for the ſtone! Thoſe who uſe only the knife, uſe the finger as a conductor for the forceps; but thoſe who uſe the gorget as a conductor for the forceps, cannot feel the ſtone with the finger, for it lies under the gorget, and the gorget exceeds the length of two fingers.

The moment the gorget is thruſt home, the operator withdraws the ſtaff, and gives it away; takes the handle of the gorget with the left hand, and the forceps in the right; the chops of the forceps being cloſe, he paſſes them along the channel of the gorget, and the moment the right hand has introduced the forceps, the left hand withdraws the gorget. Then the operator, taking the handles of the forceps, one in each hand, begins to feel for the ſtone; the forceps muſt, by paſſing along the gorget, inevitably paſs over the ſtone; let him, therefore, taking the two handles

of the forceps, one in each hand, ſtand high above his patient, point his forceps downwards towards the bottom of the pelvis, to that ſac or bulging of the bladder, in which the ſtone uſually lies, and there he, in nine of ten caſes, will encounter the ſtone; if he feels it with the forceps, and cannot ſeize it, it is becauſe he has paſſed over it, and touches it only with the lower ſide of one of the chops. When he feels that he preſſes the ſtone with the point of the forceps, he then opens the blades with both hands, graſps the ſtone, tries the hold he has of it in a way which it is impoſſible to deſcribe, then, by graſping very firm with the right hand, at the extremity of the handles, he holds the ſtone firm, and, by laying the left hand on the forceps, and holding with it alſo, he aſſiſts the right, confirms the hold, and prevents at the ſame time (by ſlipping his left fore-finger into the hinge) any undue preſſure ſuch as a ſoft ſtone will not eaſily bear. Having thus fixed his hands, he begins to pull; and if the ſtone be ſmall and the inciſion free, it comes eaſily and ſmoothly along. But I have obſerved that the young ſurgeon, when he feels the ſlighteſt oppoſition, expects to ſucceed by turning, twiſting, and every kind of unmeaning violence, and has no abſolute rule for a ſtage of the operation, which ſhould yet be performed with an intention and manner as determined as any other. If the ſurgeon holds firm and pulls in one uniform direction, though he had the ſtrength of a Cyclops, he could not ſucceed; if he turns and twiſts his forceps from ſide to ſide, "this way and that way, çà-et-là," as if he were dilating, not extracting, according to the directions of Paræus, ſince he is pulling without any deſign, he ſtill has but little chance to ſucceed. If he will but reflect on the operation of the forceps, that the forceps are two levers with which he is to act alternately, depreſſing firſt one ſide of the ſtone, then the other, he will not ſcruple to adopt that deciſive manner in extracting, which, though it ſeems harſh, is really eaſy, and relieves his patient the moſt ſpeedily, and with the leaſt violence. Let him, after having ſeized the ſtone fairly, preſs the handles of his forceps firſt down, then raiſe them up, then depreſs them again, with a wide and free motion, and he will be ſenſible, that by this ſlow and equable motion, the parts are little bruiſed by the cheeks of the forceps, and the ſtone will be, in a few ſtrokes, brought to the mouth of the wound, and turned out, by one wide but gentle movement, into the left hand of the ſurgeon, which is held with the palm upwards ready to receive it.

Posture for Lithotomy.

Fig 1.st

a

Lithotomy with the Gorget

Page 200.

Manner in which the Gorget is run in upon the Staff

Fig 2.d

a

† The point of the Catheter supporting the fundus of the Bladder — which shows the danger of running in the Gorget.

Drawn by I. Bell.

Engraved by W. Skelton.

Figure 2. Shows that the Staff is to be felt for in the upper angle of the wound.

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OF THE CAUSES OF THE SLIPPING OF THE GORGET.

It will be eaſily perceived that the critical movement on which the fate of the patient depends, is, the cutting the urethra, the lodging the beak of the gorget in the groove of the ſtaff, and the driving home the gorget. In attending operations, I have obſerved, in this moment, ſuch a degree of heſitation and evident alarm on the part of the operator, as convinces me that it is a moſt important duty to explain the various cauſes of the gorget ſlipping off from the groove of the ſtaff: he will beſt guard this accident, who is aware of every poſſible cauſe: it proceeds, like every important error, from want of knowledge in anatomy: Since we often ſee the ſurgeon ſeeking the femoral artery for an hour, to tie it in a ſound thigh, (the aneuriſm being in the ham,) we need not wonder if ſuch an executioner mangle the urethra in attempting to perform lithotomy, and conclude with thruſting his gorget betwixt the bladder and rectum.

1ſt, It ſometimes happens, that the ſurgeon, deceived by the common deſcription, and expecting to cut his inciſions fairly upon the bend of the ſtaff, goes deep into the hollow of the pelvis, and yet, after much diſſection, feels no ſtaff;—falling then into confuſion, and anxious to be relieved from this diſtreſſing ſcene, he begins to believe that he muſt *ſomehow* have cut the urethra, and, believing this, he at a venture thruſts in his gorget: Sometimes the ſurgeon, having felt the ſtaff, and diſtinguiſhed the membranous part of the urethra, and turned up the knife, cuts into the groove with ſo tremulous a hand that he hardly wounds it; and having failed to diſſect the urethra naked, before making this inciſion, the fibres of the levator-ani muſcle cloſe upon the ſmall ſlit which he had made in it, and thus, after feeling diſtinctly the groove of the ſtaff, he loſes it again, and his gorget paſſes betwixt the bladder and rectum.

2dly, Confuſion and alarm, in the ſimple buſineſs of cutting the urethra, is a ſure indication that the ſurgeon is in danger of doing ſomething very terrible. Often you will obſerve the ſurgeon, in place of turning up his knife at once, and ſtriking it ſteadily and firmly into the groove of the ſtaff, lay down the knife, and lift it alternately ſeveral times; firſt he believes that he has cut the urethra, and then again becomes ſenſible, either that he has not cut it, or that he has loſt the ſmall ſlit that he had made. I have ſeen the operator give away the knife, receive the gorget

from the aſſiſtant, point it at the groove of the ſtaff, and try to introduce it, reſume the knife, and make new inciſions in the urethra, five or ſix ſucceſſive times. I have ſeen the gorget driven twice, not into the bladder, but deep among the bowels, for although there was a ſtone, the ſurgeon never reached the bladder, never one drop of urine flowed, the ſtone was not extracted, and the boy died; this laſt miſtake is mere butchery; the firſt is little ſhort of it, for if every time that the ſurgeon reſumes the knife, he has loſt his firſt inciſion and makes a new opening in the urethra, if every time that he loſes one inciſion, the urethra has turned in ſome ſlight degree upon the ſtaff, before he makes another, the ſucceſſive inciſions will almoſt entirely ſeparate the urethra from the bladder, and the ſlighteſt puſh of the gorget will drive off the gland from the urethra.

3dly, There is much too in the direction in which the gorget is driven forward, for though the urethra be fairly cut, yet the angle at which the ſtaff is held, or manner in which the beak of the gorget is laid to the groove of the ſtaff, may diſappoint the ſurgeon of his purpoſe, and make the gorget ſhoot paſt the bladder or puſh off the gland from the urethra. If the handle of the ſtaff be too much depreſſed, ſo as to turn its point high up towards the fundus of the bladder, while the gorget is pointed too low towards the rectum, the gorget, in place of entering ſmoothly, will ſtart off from the ſtaff: or if, on the other hand, the handle of the ſtaff be held too high, is too near the groin, too much in its firſt poſition, and the gorget pointed much upwards, the directions of the groove and the beak of the gorget will not correſpond; the cutting edge of the gorget will not be ſo directed as to cut its way forward; the beak will hitch againſt the point of the gland, and may, eſpecially if the urethra be mangled, force off the neck of the bladder and proſtate from the urethra.

4thly, The ſurgeon, in place of moving the gorget along the groove of the ſtaff, ſometimes allows both gorget and ſtaff to go together deeper into the bladder, till they touch its fundus; ſometimes the operator, by an awkwardneſs in the poſture of the gorget, needs to uſe ſuch force, that the gorget, when it ſtarts through the firſt obſtruction at the neck of the bladder, may (eſpecially in a contracted bladder) wound the fundus, the parts and inſtruments ſtanding in the poſture repreſented in figure 4. Even the forceps, blunt as they are, may, by rudeneſs and ignorance, be driven through the fundus of the bladder, the ſtone eſcaping by the rent, where the forceps cannot follow! it into the cavity of the abdomen. Thoſe who prefer the gorget, and regard it as the ultimate improvement of this operation, avow theſe facts.

"I have more than once (ſays Earle) known a gorget, though paſſed in a right direction, puſhed on ſo far and with ſuch violence, as to go through the oppoſite ſide of the bladder."

5thly, If the ſtaff be ſhort and the aſſiſtant unſkilful in the management of it, he may, after the ſurgeon has cut the urethra, allow the ſtaff to recede from the bladder, and, in thruſting it back, puſh its point not home again into the bladder, but out through the wound in the urethra! The ſtaff being thus lodged betwixt the rectum and bladder, the gorget muſt follow it; the ſurgeon feels the groove of his ſtaff quite naked, fixes the beak of his gorget, and drives it home in the true direction, but no urine flows! upon introducing the forceps, he feels no ſtone! he is in the end, after much violence, obliged to put his patient to bed to die. Such an accident is recorded by Mr. Earle, it proves the dangers of this particular operation with the gorget, and the ſuperiority of that with the knife; the plunge of the gorget, to thoſe who know to operate only with the gorget, is irremediable, but a ſurgeon perfectly acquainted with the parts, and ſkilled in diſſection, would, in ſuch a caſe, introduce his finger, feel for the proſtate, ſtrike his knife into it, and, putting in his finger, guide the forceps into the bladder, and at leaſt extract the ſtone if not ſave the patient. Cheſſelden once performed this, when another operator had failed, and puſhed his inſtruments betwixt the bladder and rectum.

6thly, Though the gorget has paſſed right, the forceps may be directed wrong, for after a firſt attempt at extraction, and when the forceps have ſlipped, the ſcoop or finger are introduced, and the forceps re-entered; but, the opening which the gorget makes, does not very eaſily admit the forceps, even when the gorget lies in the wound, to guide them; after the gorget is withdrawn, the forceps enter with greater difficulty, they ſlip more eaſily in among the looſe cellular ſubſtance of the rectum. The operator opens the forceps, and feels in vain for the ſtone; he at laſt has an indiſtinct perception of the ſtone, cloſes them upon it, graſps it, and begins to pull; but the forceps ſlip; the bladder is betwixt the ſtone and the forceps. Theſe are the true ſacculated ſtones, but the ſac is the bladder, and the cavity is that which is made among the cellular ſubſtance of the rectum, by the turning of the forceps in ſearch of the ſtone, and the opening their blades violently to graſp it. In one unfortunate caſe, the ſurgeon, groping thus upon the outſide of the bladder, actually graſped with the point of his forceps, and twiſted away, the great part of the proſtate gland, which, when he had thrown it down

among his feet, was picked up by a profeſſor of anatomy who aſſiſted at the operation, and, when the gentleman died, the parts were diſſected out, and are preſerved.

It is unqueſtionable that the gorget is often thus plunged among the viſcera, and perhaps it is to be lamented that ever cutting for the ſtone ceaſed to be a diſtinct profeſſion, or that the operation was brought to that kind of perfection, which induced ignorant men to venture upon an operation which, even thus ſimplified, requires conſummate ſkill and knowledge. Whatever may be the aparent facility of this common operation with the gorget, that with the knife is alone ſecure, it is indeed to the laſt degree ſimple, as ſimple as that of cutting on the gripe; for it is cutting with the knife upon the ſtaff, which is more eaſily held, fixed and directed, than the ſtone. But ſince the operation with the gorget has been approved, and will continue to be performed, I have taught it faithfully; nothing can, in my opinion, ſo well prepare the young ſurgeons againſt this fatal accident, the ſlipping of the gorget, as knowing perfectly the cauſes from which it may ariſe. And I will now fulfil my purpoſe of deſcribing the ſeveral acts and ſtages of the operation in that rapid ſucceſſion in which they ſhould be performed.

THE OPERATION OF LITHOTOMY.

An operation ſo mechanical as this, regulated in its moſt critical movement by a grooved ſtaff, ſhould, though there muſt be no unbecoming haſte, proceed rapidly without a pauſe, the ſeveral acts being connected in idea, and continuous in execution. The ſurgeon ſhould never, to catch the vain applauſe of the ill-judging ſpectators, proceed in haſte and trepidation; but he who can perform the operation at all, will perform it beſt to his feeling, and, for the ſafety of the patient, rapidly; for, having the purpoſe of the operation full in his mind, its ſeveral ſtages are as parts of one continued action, on which his mind is ſo intent, his judgment ſo clear and unperplexed, his hand ſo ſteady and reſolved, that he moves, by a ſort of inſtinct, without pauſe as without fear. In truth, dextrous and rapid execution are ſynonymous words; it is not policy, but feeling and ſelf-confidence, that carries the ſurgeon boldly on; this rapid energetic manner is natural and not aſſumed; it is even in ſome degree eſſential to the patient's ſafety, that the ſeveral acts

ſhould ſucceed each other without ſtop or pauſe,—that, the gorget ſhould be introduced as ſoon as the urethra is cut,—and, the forceps inſtantly after the thruſting-in of the gorget.

The ſurgeon ſhould be prepared for this, and, in place of receiving and returning every inſtrument from his aſſiſtants, ſhould draw each inſtrument from his girdle when he is to uſe it. Every thing being prepared, he ties an apron about him, which being firmly girt, he twiſts a towel through the apron-ſtring, fixes the gorget alſo in the ſtring like a dagger in the girdle, and the forceps he puts in the fore-pocket of his apron. Then advancing to the patient, who is tied and placed for operation, though his poſture is not yet adjuſted, he dips the ſtaff in oil and paſſes it gently and ſoftly; he then dips the finger in oil and inſinuates into the rectum, to feel that all is right and fair; he then wipes the fingers that are ſoiled with urine or fæces, or lubricated with oil, and ſeats himſelf before his patient, on a low ſtool, pulling the breech towards him, till it projects fairly over the edge of the table, and preſſing-in the doubling of the blanket under the breech, till he has raiſed it to a proper angle; he then commits the patient's feet to the lateral aſſiſtants, who are to keep the breech in this ſuſpended poſture: Then reaching his right hand over the patient's breech, he takes a firm hold on the handle of the ſtaff; preſſes its heel againſt the perinæum; feels for it immediately behind the ſcrotum with the fore-finger, or with the edge of the thumb; lays down the handle of the ſtaff to the right groin, and gives it to the aſſiſtant ſurgeon to keep it ſteady.

He now wipes the perinæum with his towel *, lays the left hand over the hip and anus, and ſpreads his fingers ſo as to ſtretch the perinæum; then fixing the point of the knife juſt below the point where he feels the heel of the ſtaff, (i. e. about an inch behind the ſcrotum,) and preſſing with the point of the knife to mark the beginning of the inciſion, he draws it with a firm and ſteady motion, obliquely downwards, till he paſſes the anus about an inch and a half, the middle and deepeſt part of the inciſion being thus oppoſite to the anus, but inclining ſomewhat towards the tuber iſchii to avoid the rectum. The firſt ſtroke of the knife paſſes through the ſkin and fat; a ſecond ſtroke, guided by the fore-finger, paſſes deep into the hollow of the pelvis, through fat tendinous faſcia, and the tranſverſe muſcle, and, in ſhort, through every obſtruction, till the opening is quite free. A third diſſection, in which the fore-finger is turned upwards to the pubis, while the

*. The rectum generally protrudes in a child, from crying and ungoverned ſtraining, and needs to be wiped and held aſide by a bit of linen cloth laid upon it.

ring and mid fingers a little crooked repreſs the rectum, lays the ſtaff almoſt bare; and then, the edge of the knife alſo turned upwards, as well as the finger which guides it, is ſtruck into the groove of the ſtaff, through the membranous part of the urethra; and the knife, being then drawn ſteadily forwards, ſlits it up from the point of the proſtate gland nearly to the bulb of the urethra, i. e. through almoſt the whole length of the part that feels naked.

The edge of the thumb-nail being fixed ſteadily in the groove of the ſtaff, the beak of the gorget is lodged in the groove; the ſurgeon, firſt moving the gorget backwards and forwards, reaches his left hand over to graſp the ſtaff, takes a firm hold of it, riſes from his ſeat, balances with the two hands for a few inſtants, and feeling that the inſtruments correſpond, that the hands feel each other, and re-act mutually, and that the beak of the gorget glides ſmoothly and equably in the groove of the ſtaff, he holds the ſtaff ſteady, clenched in a dagger-like manner, in his left hand, and puſhes the gorget ſteadily, ſtrongly, but ſlowly, forward with his right. The moment that he feels the reſiſtance over, and the urine flow, he begins to give that turn to the ſtaff (viz. depreſſing the handle of it to the belly of the patient), by which the gorget is diſengaged and the ſtaff withdrawn; he ſlips the ſtaff into his pouch, or lays it down, ſeizes the handle of the gorget with the left hand, draws out his forceps with the right, lays the chops of them gently in the broad channel of the gorget, puſhes them gently onwards into the bladder, and when he feels them in the open cavity, he withdraws the gorget, withdrawing it carefully in the direction in which it was puſhed in, that its edge may make no ſecond wound.

The ſtaff is withdrawn as a part of the ſame motion by which the gorget is introduced; the gorget is withdrawn as a part (the concluding part) of the ſame motion with which the forceps are introduced; the gorget is next ſlipped into the pocket of the apron, and both hands applied to the forceps, one to each handle; and the operator, conſcious that the forceps now look directly upwards towards the fundus of the bladder, where the ſtone cannot be, and that the gorget has carried them over the ſtone, raiſes the handles high, and while he opens the blades gently, points them downwards to the ſac behind the proſtate, and near the neck of the bladder where the ſtone lies; and he withdraws them at the ſame time a little, that they may have the ſtone before them: He then puſhes the ſtone before him, and thus excites the bladder to contract, and preſs it cloſe to the chops of the forceps; he cloſes them, and preſſes once or twice in directions ſlightly varied, according to feelings which cannot be deſcribed, before he thinks himſelf ſure of his

hold; but when he is ſure, he graſps firmly, very firmly, becauſe, if the ſtone be ſo large as to endanger its breaking, he is more willing that it ſhould break into a hundred pieces than injure the parts by dilatation; and he now depreſſes the handles quite low, becauſe the direction in which he is to extract the ſtone, is entirely oppoſite to that in which he catches it. The forceps, holding the ſtone, now point directly upwards as at firſt; he holds firm, and pulls almoſt directly downwards, that the preſſure may be, not againſt the pelvis, but againſt the dilatable parts in the lower angle of the wound; and moving his forceps gently, ſlowly, ſteadily, from ſide to ſide, with a very wide motion, he depreſſes, firſt, the upper ſide of the ſtone, then the lower ſide, and ſo alternately, till the wideſt parts of the chops ſtretch the wound! the ſtone begins to appear! he holds the palm of the left hand, which had hitherto held firm the hinge of the forceps, ſo as to receive the ſtone! and with one wide motion of the forceps moving the handles largely downwards, he turns it out.

If the perinæal artery, which is unavoidably wounded, is large, and bleeds profuſely, it is uſually tied with the needle after the external inciſion, and before the urethra is cut. If the hæmorrhagy be neglected till the operation is finiſhed, the arteries are then ſo bruiſed, and ſo retracted among the cellular ſubſtance, that they never bleed again; if there be any internal hæmorrhagy from arteries larger than common, courſing round the proſtate gland, and cut with the gorget, it is diſcovered only ſome hours after the patient is laid in bed; it is known by the deſire to paſs urine, the ſenſe of load at the lower part of the abdomen, and reſtleſſneſs and pain; and it is relieved by puſhing in the finger, and breaking down the coagula, which are then diſcharged as from the uterus in an abortion, and then, if freſh blood continues to flow, farther danger is prevented by thruſting a wide canula into the wound, ſurrounded with a piece of dried ſponge, the canula being paſſed through a hole in the centre of the ſponge.

The ſtone being extracted, the ſurgeon, having examined and aſſured himſelf that there is no ſecond ſtone, lays a piece of oiled lint within the lips of the wound; unbinds the patient, and lays his thighs together, the knees being bended, and, an aſſiſtant holding his hand flat over the wound; and the patient is conveyed to bed, and laid on his right ſide. An opiate is given with a glaſs of warm wine and water; the curtains are drawn, the windows cloſed, and a medical attendant being left by him to watch any acceſſion of hæmorrhagy, or abdominal pain, he is compoſed to reſt; the urine which flows freely through the wound is received upon a thick

folded cloth. The warm bath, glyſters, bleeding, if he be an athletic man, and embrocating the lower part of the belly with ſpirituous applications, are the chief means for preventing abdominal inflammation.

I hope that, in preparing my reader for underſtanding this deſcription, I have with proper ſerioufneſs inculcated the importance of ſtudy, and the fatal conſequence of imitating, without intelligence or deſign, the motions of other operators; that I have not, by any preſumption on my part, incited the young ſurgeon to any raſh or unpremeditated attempt or new exploit, but have deſcribed perſpicuouſly, ſimply, and with a ſincere ſenſe of duty, the moſt important and eventful operation in ſurgery.

To what extent, and with what variety of illuſtrations, a ſubject like this may be explained, it would ill become me to decide. I may have been partial to a ſubject which I have ſtudied for many years, or to theſe views which have preſented themſelves to my mind; I may have erred in explaining, too diffuſely, difficulties which I acknowledge to have felt myſelf, and which it is allowable to believe others may alſo feel. Whether I have written too much or too little, is a queſtion which ſome will be very willing to propoſe; but our general profeſſion, a learned, impartial, and honeſt jury, will decide: but this I am ſure will be allowed me, the merit of good intentions and the choice of a ſubject intereſting in itſelf, and in its relation to many important points of ſurgical practice.

Dissection of the Parts after Death.—

The Stone remaining in the Bladder — Page 208.

J. Bell. delin.t

W. Skelton sculp.t

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EXPLANATION of the PLATE facing Page 208.

THIS drawing was taken from the bladder of a man who had been cut for the ſtone, but having two ſtones and the ſurgeon being ſatisfied with extracting one, the man died on the eighth or tenth day.

a. Marks a part of the colon naked, uncovered of its peritoneum.

b. b. b. Marks the edges of the peritoneum diſſected ſo as to ſhow the naked gut (*a*) and the fat under the membrane.

c. c. The colon inflated with air turning down behind the bladder to form the rectum.

d. The fundus of the urinary bladder covered by its peritoneal coat, the cut or diſſected edges of which are marked (*e. e.*)

f. f. The outſide of the bladder uncovered of its peritoneal coat.

g. The inſide of the bladder opened by the turning down of the triangular flap (*b*) ſo as to ſhew the remaining ſtone (*i*) and the point of the catheter (*k*) projecting into the bladder.

l. Marks the proſtate gland.

m. The crus penis cut away from the arch of the pubis.

n. The erector penis muſcle cut acroſs.

o. o. The fat ſurrounding the rectum.

p. The anus.

q. q. The extent of the wound made in operating.

r. A probe paſſed through the wound (*s*). The buttoned end of the ſame probe within the bladder.

t. A calcareous cruſt collected round the inſide wound upon the inner ſurface of the bladder.

But the point which I hold it moſt important to demonſtrate, is the great diſtance deſcribed by the dotted lines (*u*) betwixt the outward and inward wound, and the cavity, marked (*v*), betwixt the bladder and rectum, which ſpace was full of matter and gangrenous ſloughs; in ſhort, the whole cavity was a foul abſceſs, and this ſpace, marked (*v*), was in particular green with mortification.

OF

OBSTRUCTION OF URINE.

SECTION IV.

OF INTRODUCING THE CATHETER.

I DO not know that even the operation of lithotomy itſelf, is more difficult, than that of introducing the catheter; more important it cannot be, than an operation which gives relief in accidents and difficulties ſo extremely common and ſo very afflicting: The one is an operation reſerved for thoſe who have attained a high reputation in ſurgery; the other muſt be attempted by every ſurgeon, young or old, in the navy or in the army, in town or country, much or little accuſtomed with operations: It is an operation which the ſurgeon muſt perform unpremeditately, without aſſiſtance or advice, in places diſtant from every help, and in circumſtances too preſſing to admit delay! where, if the patient be left unaſſiſted, even for a few hours, his ſituation will become hopeleſs and irremediable.

The operation of introducing the catheter, if it do not require intrepidity and courage, requires at leaſt peculiar delicacy, a perfect knowledge of the parts, and above all a humane and ſteady temper; for when the ſurgeon is at any time conſcious that he is in danger of committing violence, he muſt ſubmit to the imputation of having failed, even at the riſk of his reputation: The obſtacles and difficulties to the introduction of the catheter are beſides of ſo peculiar a kind, that while all our diligence to learn this art is neceſſary, our utmoſt diligence is ſometimes unavailing, for the moſt unſkilful ſurgeons have ſucceeded, by a ſort of chance, even after the moſt dexterous have failed. Petit failed! Petit and three other ſkilful ſur-

geons attempted in vain to introduce the catheter, which was in the end introduced with all imaginable eaſe by a ſurgeon of very inferior ſkill,—if Petit conſents to make ſuch an avowal, let no man be aſhamed of failing in this delicate operation, nor be induced for the ſake of reputation, to puſh the catheter rudely onwards.

There is no operation with which I ſhould more earneſtly entreat the young ſurgeon to make himſelf acquainted than this of introducing the catheter: Obſtructions of the urethra daily happen, in every ſtage of life, and in all ranks: in the vicious, and in the innocent; in boys, from ſtones paſſing along the urethra; in young men from gonorrhœa, ſtrictures, intoxication, and various kinds of miſconduct. It ariſes too from diſeaſes produced by no immoral vice; often it ariſes from modeſty and reſtraint, from falls affecting the ſpine, from low fevers, from palſy, and from the natural failings of old age; and the proſtate gland, when it becomes diſeaſed, forms a tumor which the moſt ſkilful hand cannot extirpate, nor the moſt ſearching medicines reſolve. So many cauſes for one fatal complaint muſt alarm us, and we muſt feel a peculiar ſympathy in reſpect to this diſeaſe, which preſents itſelf to the imagination (and alas! too truly) as one of the moſt natural failings and moſt afflicting concomitants of old age. Theſe fatal obſtructions are rare in country hoſpitals, and in country practice; for the poor are early ſubdued by hard labour, and have not the deſire nor the means of indulging in any dangerous vice; "they have not, in their youth, applied hot and rebellious liquors in their blood, nor have not, with unbaſhful forehead, wooed, the means of weakneſs and debility." If in the hoſpitals of a great city, ſuch as London, diſeaſes of this nature are more frequent, it is among ſoldiers and ſailors, and the brood of vagabonds that infeſt a capital. But theſe terrible diſorders are moſt peculiarly frequent in the higheſt ranks of life, and eſpecially with thoſe who have rioted in all the luxuries of eaſtern countries; and, in proportion as life advances, thoſe effects of early follies fall heavier every day, and many, exhauſted by ſleepleſs nights and continued pain, have their ſtrength gradually impaired, till at laſt they ſink under the diſorder, without ever having ſuffered a complete obſtruction of the bladder.

There are no circumſtances in which the patient is more perfectly grateful, than for the relief which the ſkilful introduction of the catheter procures; for it is a ſudden and intire relief, from anguiſh more excruciating than any deſcription of pain. Often the value of our aſſiſtance is enhanced by the unſucceſsful attempts of others leſs fortunate or leſs ſkilful. To feel this uneaſineſs and intenſe deſire

to paſs the urine, to ſubmit to a dreaded operation, and yet to be diſappointed of relief; to ſee the blood ſtreaming from the penis, and ſtill to continue in agony; to lie toſſing with fever and pain, aggravated by diſmal recollections of many having died of obſtruction of urine; and then in the midſt of theſe ſufferings, to receive ſudden relief, from the hands of a ſkilful man, muſt be accompanied with a deep ſenſe of gratitude. Such reflections as theſe, my reader will not think unnatural. I would condeſcend to ſuggeſt even ſelfiſh motives, to the few who are born to feel no others, as inducements to ſtudy thoſe diſeaſes of which I am now to offer a ſhort practical ſketch; I ſhould be inclined to blame the ſurgeon very much, who was not equally prepared to uſe the catheter as to uſe the lancet.

The introduction of the catheter is an operation which a good ſurgeon, who is able to perform with eaſe, would be apt to deſcribe with little care or minuteneſs; and there is unfortunately in this, if any part of ſurgery, a kind of addreſs which is to be attained only by practice! for let the experienced ſurgeon pay what attention he will to his own manœuvre, he will find ſomething in it which he muſt deſpair of teaching by words alone. Yet this experience and acquired dexterity is founded on previous knowledge of the parts, and I ſhall reckon it one of the moſt important uſes of my anatomical drawings and plans, if they enable me on this ſubject to expreſs my conceptions clearly. I ſhall give, as the firſt and moſt ſimple leſſon in this department of ſurgery, that of introducing the catheter, in caſes where the urine is retained, not from any reſiſtance ariſing from tumor or other obſtruction in the urinary canal, but from paralyſis or mere want of power in the bladder itſelf.

When from remaining too long in ceremonious companies, in aſſemblies, in proceſſions, or in courts of juſtice; when from travelling in public carriages, or from any cauſe of delicacy or reſtraint, a man reſiſts too long the calls of nature, the bladder being over-diſtended, loſes its contractile power, and when he would paſs his urine he makes vain and painful efforts to diſcharge it: a ſpaſm about the neck of the bladder then ariſes, and reſiſtance is added to want of contractile power; every repeated effort increaſes the difficulty, and pain ſucceeds to the ſimple deſire of emptying the bladder. It is this pain and ſpaſm alone that prevents the catheter paſſing with perfect eaſe, and makes all the oppoſition we experience in performing that operation on the living body, which is ſo eaſily performed on the dead; for, the introducing the catheter in a corpſe, is not a leſſon of that importance which has uſually been ſuppoſed.

It is the ſpaſm and univerſal contraction of the parts, and in ſome degree the altered poſture of the bladder, in regard to the canal of the urethra, that occaſions this difficulty of paſſing the catheter ; for there are various cauſes from which retention of urine ariſes, in which the difficulty of introducing the catheter is various. The catheter paſſes with perfect eaſe, when the retention of urine proceeds from a paralytic affection of the bladder, as in fractures of the ſpine, in palſy or apoplexy, in confluent ſmall-pox, in the end of low fevers. In child-bed women the retention of urine, which is ſo frequent in tedious labours, ariſes merely from over-diſtenſion, and conſequent paralyſis of the bladder, for it continues many days or even weeks after delivery, after the preſſure produced by the head of the child within the pelvis is removed with them the catheter is eaſily introdueed. Even in caſes when ſtrangury and pain, accompanied with intenſe deſire, have followed the ſimple retention of urine; in caſes when the canal is generally inflamed as in gonorrhœa, the ſurgeon ſhould ſtill be able to paſs the catheter with tolerable eaſe. But in caſes of ſtricture or other diſeaſe in the urethra, the catheter is ſeldom uſeful; and where the proſtate gland is diſeaſed, it paſſes with the utmoſt difficulty if, indeed it can be made to paſs by any means.

Suppoſe then that a young man has for three weeks been afflicted with gonorrhœa, with much ſcalding and pain, has felt the inflammation gradually deſcend towards the place of the proſtate, and has notwithſtanding had the imprudence to ſit long at table drinking with his comrades, or has been revelling with them all night in the ſtreets, he is brought to you in the morning writhing with pain, or you are called to ſee him at his own houſe, and find him ſtalking through his chamber grinding his teeth, and ſtraining violently to paſs his urine; ſo that in conſequence of the cold, and the liquors he has been indulging in, there has been a quick ſecretion of urine, the bladder is greatly diſtended, there is tumor in the lower part of the abdomen, the penis is in a ſtate of partial erection from pain and irritation, the running ſtopped, the point of the penis quite dry, and the perinæum ſenſibly painful to the touch. You proceed in the following manner:

You place your patient with his back reſting firmly againſt the wall, ſtriding but not very wide, his feet being projected before him a very little; and you place yourſelf on his left ſide, kneeling on your right knee; you may lay him acroſs the bed, his feet reſting on the floor, his buttocks touching the edge of the bed, and his head and ſhoulders ſupported with the pillows; or he may ſeat himſelf upon a chair, reſting with his hands upon the ſeat, the perinæum projecting a little over

the edge of the chair, and one of his friends ſtanding behind to ſupport him. In whatever poſture you place your patient, you find the poſture of kneeling on the right knee the moſt convenient for yourſelf; it gives you perfect ſteadineſs; and, by placing yourſelf low with regard to the patient, you obtain a perfect command of your catheter, which, while you are introducing it, is to move in a circle.

You lift the point of the penis betwixt the fore and mid-fingers, ſecuring the poſture of the penis by preſſing the glans with your thumb: then taking the catheter, which is previouſly warmed, and ſmeared with oil, white of eggs, or butter, in your right hand, you hold it firmly by the ears, betwixt the thumb and fore-finger; and while you hold by the wings with the finger and thumb, you lay the middle, ring, and little fingers, flat acroſs the ſhaft, juſt as you would a pipe. You then apply the point of the catheter to the opening of the urethra, and glide it down ſteadily and rather rapidly along the urethra, drawing the penis with the left hand, preſſing the catheter onwards with the right, and guiding it with a ſemi-circular ſweep round the pubis, in proportion as the catheter paſſes along the urethra. The two hands thus re-acting, the catheter glides onwards without obſtruction, till it has turned round the pubis, and you become ſenſible by the turn, by the length it has paſſed, and by the degree of reſiſtance, that it has approached the neck of the bladder, and is juſt about to enter it.

This is the critical moment, in which may be ſeen whether a ſurgeon can or cannot paſs the catheter; for if he knows how to paſs it, he ſuddenly, but not violently, changes its direction. He depreſſes the handle with a particular kind of addreſs, and raiſes the point, which, as if it had ſuddenly ſurmounted ſome obſtacle, ſtarts into the neck of the bladder, and the urine burſts out in a jet from the mouth of the catheter.

Thoſe who are unſkilful preſs the tube forward, and perſiſt, as they had begun, in drawing up the penis, pulling it out to an immoderate length, imagining, as indeed they are plainly told, that by ſtretching the penis, they lengthen the urethra, and make it ſtraight, whereas, they elongate only that part of the urethra along which the catheter has already paſſed.

In truth the elongation of the penis does not at all affect that part of the urethra at which the catheter is interrupted, the part viz. which lies in the perinæum, and is fixed by the various connections with which my reader is not unacquainted: a dexterous ſurgeon indeed generally paſſes the catheter with one continuous motion

uninterrupted, and without letting go the penis; but when he does feel that he is obſtructed he lets go the penis, as of no further aſſiſtance; he, (while his aſſiſtant holds up the ſcrotum,) lays two fingers along the perinæum, on each ſide of the urethra, and draws the fingers along the perinæum towards the ſcrotum, ſoothing the parts, and relaxing the ſpaſm, by the preſſure and motion, and acting as if the deſign were to work the urethra along the catheter, as he would put the bait on a hook. If this fail, he, kneeling before the patient, oils the left fore-finger and paſſes it into the anus, the effect of which is, I am perſuaded, neither the elongation of the urethra, nor the unfolding any inequalities of the canal, but merely lifting up the point of the catheter, by the preſſure of the finger, and with a degree of force and effect which the ſurgeon has not the confidence to uſe in the proper way of bending down the handle of the ſtaff.

This critical movement is ſo deciſive of ſucceſs, that I cannot help illuſtrating it by a plan and explaining it farther: it will be eaſily underſtood from the plan, that if the ſurgeon perſiſt in puſhing the catheter onwards in the direction (a) in which its point firſt meets this reſiſtance, the catheter will, in place of plunging into the bladder, be driven through the thin membranes of the urethra at (a), into the cellular ſubſtance of the bulb, whence will follow an immoderate flux of blood: in place of directing the catheter in ſo unguided a manner as to encounter this obſtruction, the ſurgeon, being aware of this difficulty, muſt be careful to avoid it; from the firſt moment of his introducing the inſtrument, he holds the catheter ſteady by the wings, with the expreſs purpoſe of turning and guiding it; from the moment in which the catheter begins to paſs along the perinæum, the point ſhould be preſſed ſtrongly againſt the upper ſide of the urethra which lies under the pubis; the catheter muſt be all along carried ſo cloſe to the arch of the pubis, as never to loſe the feeling of preſſing hard againſt the bone, and when it approaches the neck of the bladder the point muſt be turned quick under the arch of the pubis, as if it were the ſurgeon's intention to keep it preſſed cloſe to the inner ſurface of the pubis now, as it had before been to the outer ſurface of the lymphyſis. While the ſurgeon makes the point run thus along the bone, as if to avoid the angle at the lower part of the urethra, he muſt guide the catheter ſteadily along, holding it firm and with an action ſomething like that of pulling, as if it were his deſign to hook the pubis. He muſt turn down the handle and raiſe the point of the catheter, I will not ſay ſuddenly, or ſtrongly, but with quickneſs and addreſs, as if it were his deſign to catch at ſome orifice, diſtinct from the canal in which the in-

ſtrument is paſſing, and to catch it with addreſs and quickneſs, as if it were an opening which might otherwiſe eſcape.

If theſe manœuvres do not ſucceed, the ſurgeon changes his catheter, chooſing one bigger or more ſlender, with a greater or leſſer curve, according to what obſervations he may have made in his firſt attempt; but if the catheter has been of a good form or commodious ſize, yet has not paſſed eaſily, he ſhould, inſtead of chooſing a rigid catheter of another ſize or form, take a flexible catheter for his ſecond attempt. The flexible catheter is generally ſlender and of ſufficient length, and its ſhape may be accommodated to all occaſions, and to all forms of the urethra; for, having a ſtiff wire, we can give that wire (either before or after it is paſſed into the catheter) whatever ſhape we pleaſe; and, what is of ſtill greater importance, we can introduce the inſtrument without or with the wire as circumſtances may direct; or what I find far more advantageous, we can introduce the wire particularly ſo as not quite to reach the point of the catheter, but within two inches or a little more of the point, by which contrivance the point, if previouſly warmed and wrought in the hand, has ſo much elaſticity that it follows the preciſe curve of the urethra, and has yet ſufficient rigidity to ſurmount any ſlight reſiſtance. If this too fail, and eſpecially if there be the ſlighteſt reaſon to ſuſpect that the reſiſtance is not merely ſpaſmodic, but ariſes from ſtricture near the neck of the bladder in a younger man, or ſwelling of the proſtate in the aged, we take a ſmall bougie, turn up the extremity of it with the finger and thumb, ſo that the hooked point may look towards the pubis, oil it lightly and rapidly, and allowing no time for the ſoftening of the wax, paſs it into the urethra, run it down nimbly to the place of the obſtruction, turn it with a vertical or twiſting motion, and ſtick it faſt in the conſtricted part; and having left the bougie thus fixed for ten minutes or a quarter of an hour, we uſually find, upon withdrawing it, (eſpecially if, in withdrawing, we feel a pull as if it would invert the urethra,) that either the urine will begin to flow, or at leaſt that the catheter will now paſs.

But when we are in theſe operations unſucceſsful, juſt as when we fail in our attempts to reduce a hernia, we reſort to other means of relieving the ſtricture of the parts, before making a ſecond attempt; firſt we bleed, bleed repeatedly, which at once prevents the moſt fatal of all ſymptoms, inflammation of the abdomen, and ſerves as an anodyne, and never can be ſuperfluous where the future dangers of the caſe, and in ſome degree the preſent obſtruction, proceed from inflammation; when we obſerve the condition of our patient, his fluſhed face, parched tongue, and rapid

pulſe, we can feel no reluctance in bleeding. We immerſe the patient in a warm bath, and rub the perinæum and lower part of the abdomen with ſtimulant embrocations, as ſpirituous and camphorated balſams or ointments; we lay hot and ſtimulant applications to the pubis, cover all the parts with a thick made poultice, impregnated with camphire or onions, and, above all, give opiate injections, very ſtrong, for we find this the moſt effectual means of alleviating the pain and deſire, or in other terms, the ſpaſmodic action of the parts: it is ſpaſm merely that intercepts the catheter; for were the patient dead, no ſuch oppoſition would be experienced; innumerable diſſections have proved that the catheter, which was not admitted in the living, paſſes eaſily in the dead body. If after a few hours of theſe applications, the pain is relieved, and the patient, by the force of the opium, is inclined to reſt, we are then able to paſs the catheter with eaſe; and when we have relieved ſuch a patient we muſt continue our attentions to him unremittingly; we give him prudent advice leſt the ſame continued life of thoughtleſſneſs and diſſipation confirm the complaint; we charge ourſelves with drawing off the urine thrice a day, till the parts recover their tone; and we never diſmiſs ſuch a patient without acquainting him, that on the ſlighteſt exceſs or imprudence, he will relapſe into this painful condition; for the bladder once diſtended is apt to be again diſtended, without creating any ſenſible effort, and, being over-diſtended, it loſes altogether its muſcular power.

The period at which a patient will recover the contractile power of his bladder muſt depend much on the conduct of the ſurgeon, who will be able to reſtore its tone, by being careful in his attendance, and preventing the bladder being at any time filled; by directing the patient to make occaſional efforts to diſcharge his urine, even although not incited by any deſire; by applying ſtimulant embrocations to the pelvis; by giving ſtimulant and purgative injections, or, by giving, if neceſſary, a few drops of tincture of cantharides; and finally by applying bliſters from time to time to the ſacrum, which I hold to be the moſt powerful means of reſtoring the contractility of the bladder: along with theſe means the walking barefooted on a ſtone floor, or having cold water daſhed or ſprinkled about the pelvis, is very effectual in ſeconding the efforts of the patient.

I have thus repreſented the moſt ſimple of all caſes of obſtruction of urine, and ſhall now proceed to ſpeak of others more difficult and complicated. With prolixity or unneceſſary minuteneſs I do not think I ſhall be reproached by any well-diſpoſed or ſenſible man, for I am teaching things which cannot be performed (as

too much has been performed) according to general theory, but ſuch as muſt be either learnt by uſe and practice, or muſt be minutely and practically deſcribed; I cannot on this occaſion, nor ſhall I, in any part of theſe chapters, venture to depend on the natural ingenuity of the young ſurgeon, but ſhall ſervilely and minutely inſtruct him in the manœuvre of every leſſer operation, and endeavour alſo to make him familiar with the ſcenes in which he has to perform his ſeveral duties.

But there remain, in reſpect to this firſt operation of introducing the catheter, ſome points not unworthy of further illuſtration. I remember to have ſeen continually practiſed an artifice which is indeed but lately diſuſed, though if we regard the motives from which it was followed, it ſhould long ſince have fallen into contempt. The ſurgeon, in paſſing the catheter, was in the practice of turning its convex ſide to the pubis, and its point towards himſelf, with the handle downwards; and when the point reached the perinæum and began to be interrupted in conſequence of this moſt unnatural poſture of the inſtrument! at the moment in which it ſhould enter the bladder! the handle was raiſed with a nimble and ſudden turn, and the catheter plumping precipitately into the bladder, in the moment of this ſudden turn, ſeemed to enter in conſequence of the ſingular dexterity of this manœuvre. The whole difficulty of the operation ſeemed to conſiſt in this movement, whence it was called, par excellence, "*Tour de Maître.*" It is natural to inquire whence ſo odd a conceit, as this of turning the catheter in this backward direction, entered into the imagination of any one. Perhaps alſo it is of ſome importance to enquire whether there be not certain circumſtances in which it may be adviſable to make ſuch an experiment.

This *tour de maître* was aſſuredly the invention of the old lithotomiſts in Italy and Germany, and, to eſtimate its value, we have to recollect who theſe lithotomiſts were. Though a barber in thoſe days was a ſurgeon, at leaſt in all that related to tooth-drawing and broken heads, and often ſtood in competition with Hildanus and Paræus; yet a lithotomiſt was not ſo: he was ſometimes a herniary doctor, ſometimes a prieſt, but always a vagabond; for thoſe who profeſſed lithotomy travelled from city to city, and ſtuck up their advertiſements upon the walls. One principal part of the myſtery of theſe itinerants was, to operate ſo that no one could diſcover what they were doing. They performed all the ſteps of their operation with ſuch a juggling dexterity, that the phyſicians, preſent at their opera-

tions, could not gueſs what was done; and the moſt celebrated among them left to the profeſſion no better legacy than diſputes about the nature of their operations: in ſhort, quacks invented this tour de maître, and ſurgeons continued to practiſe it, that their pupils and ſpectators, might hold ſuch ſingular and inexplicable operations in high reverence, and not attempt what ſeemed ſo difficult. Petit, a century ago, remonſtrated with his contemporaries againſt this abſurdity, declared it to be extremely dangerous to perform this turn with all the rapidity which was uſually affected by ſuch as eſteemed themſelves dexterous operators, and declared, that he always introduced the catheter over the belly *. Yet even in the preſent day the propriety of the old practice is defended. There is in the ſecond volume of the Medical Memoirs, a moſt important diſcuſſion of this very queſtion, in which the ſole diſpute betwixt Mr. Bromfield and Mr. Ware is not whether the tour de maître ſhould be performed at all, but how it ſhould be performed: Mr. Bromfield adviſes us to give the catheter a ſudden and very clever turn; Mr. Ware adviſes that this maſterly turn ſhould be performed with all poſſible deliberation and ſolemnity.

If, in introducing the catheter, you find your inſtrument ſtop early in a lower part of the urethra, and have reaſon, from the hiſtory of the caſe, to believe that the obſtruction ariſes from ſtricture, you muſt not perſiſt in preſſing on your inſtrument, but withdraw it, and paſs a ſmall bougie, or uſe a cauſtic.

If, in paſſing the catheter, you encounter a ſtone, which you know by the catheter grating againſt it, be not raſh to drive it back into the bladder, but preſs your finger upon the perinæum behind the ſtone, leſt it ſhould be driven back,—withdraw your

* " Ces différentes manœuvres, difficiles à décrire, ſont encore plus difficiles à exécuter que l'on ne penſe. Avant que d'aller plus loin, qu'il me ſoit permis de demander à ceux qui ſuivent la méthode ordinaire, quelles raiſons ils peuvent avoir de la préférer à l'autre: plus je réfléchis ſur le demi tour de main, et moins j'en connois l'utilité; je dis de plus que la prétendue élégance, de laquelle ſe piquent ceux qui font ce demi-tour, ne peut jamais être utile, et qu'elle peut avoir des inconvéniens, ſur-tout lorſque, ſe piquant de vîteſſe, on fait ſubitement ce demi-tour, et qu'on baiſſe bruſquement et preſqu'en même tems la main, pour pouſſer le bout de la ſonde dans le col de la veſſie.

" La méthode de paſſer la ſonde par-deſſus le ventre me paroît ſi naturelle, que je ne puis m'empêcher de croire que l'autre façon de ſonder *n'ait été imaginée par les anciens Lithotomiſtes, que pour maſquer la manœuvre, et faire paroître aux Eleves ſpectateurs, qui auroient envie d'entreprendre cette opération, qu'elle eſt bien plus difficile qu'elle ne leur paroîtroit ſans doute*, s'ils ſuivoient la méthode la plus ſimple et la plus naturelle: ce que je dis paroîtra vraiſemblable, ſi on ſe rappelle que les anciens Lithotomiſtes faiſoient cette opération en cachette, ne ſouffroient de ſpectateurs que le moins qu'il leur étoit poſſible, et que quand ils étoient obligés d'en ſouffrir quelques-uns, ils cachoient toujours les manœuvres les plus ſimples par quelques mouvemens myſtérieux."

catheter, and ſtop to conſider of the caſe, and the means of giving ſafe and permanent relief.

But if from the age of your patient and the hiſtory of his complaint you ſuſpect the proſtate gland to be diſeaſed, and eſpecially if, from introducing your finger into the anus, you are aſſured that the complaint is of that diſmal nature, you may, after having failed in the common way, turn the concavity of your catheter towards the perinæum, and give it the turn, the "*tour de maître*," at that point of your progreſs in which you are ſenſible of the oppoſition from the diſeaſed gland and would paſs your inſtrument through it. I have ſometimes imagined that this method of operating contributed to open the cleft or valve-like mouth of the tumid proſtate; and this tour de maître, though abſurd as a general practice, implying nothing but an affectation of dexterity, is ſurely allowable where all attempts are allowable! in a diſeaſe where, if we fail with the catheter, the moſt violent meaſures muſt be reſorted to, and the catheter itſelf or ſome other inſtrument be driven into the bladder by main force.

I am next, I confeſs, anxious to make the due impreſſion on my reader's mind, when I come to explain a prejudice which has indeed almoſt ceaſed to appear in this odious light, from being avowed by men of high reputation and ſupported by facts. It has been aſſerted, that though, upon introducing the catheter, blood flows from the urethra in a full ſtream, "No harm is done; ſuch hæmorrhage is rather uſeful, and facilitates every future attempt to paſs the inſtrument." I will freely acknowledge that often, from a ſlight injury, a great profuſion of blood will flow; this is an inevitable conſequence of the peculiar ſtructure of the parts, and no great harm enſues; but that ſuch a diſcharge of blood is entirely harmleſs, is a ſign of dexterity, or of any thing but aukwardneſs, violence, and a breach of the cellular ſubſtance, I cannot allow.

Every prejudice exculpatory in its tendency, and of courſe acceptable to the profeſſion, will have its ſupporters; and this in particular has long maintained its ground. Mr. Bromfield and Mr. Ware, in the paper already alluded to, acknowledge that, in their own practice, blood often follows the attempt to introduce the catheter; they have pretty plainly inſinuated that ſuch flux of blood is uſeful; and the following tale from Petit has been repeated rather more frequently than it deſerves, becauſe it is one which may be unbluſhingly repeated by every ſurgeon to whom it happens, (as often it muſt happen,) that he fails in his attempt to introduce the catheter, and blood alone flows through the inſtrument in place of urine:

"A merchant in Paris, having been all night tormented with ſtrangury, got up early in the morning and went ſtraightway to his ordinary ſurgeon, who lived but a few doors off: the ſurgeon, after being told the nature of his complaint, proceeded to paſs the catheter. But after giving him exceſſive pain and cauſing an exceſſive flow of blood from the urethra, he refrained from farther attempts, adviſed the gentleman to return to bed, and promiſed that in an hour he would call and take blood from his arm. In place of returning home, he went to the houſe of another ſurgeon of the neighbourhood; who having relieved him by introducing the catheter without violence, or the ſlighteſt degree of pain, he returned to his own houſe, well pleaſed to think himſelf thus perfectly cured, and when his own ſurgeon came to viſit him, he told him that he had moſt providentially paſſed his urine, and that he thought he had beſt defer the bleeding.

"But after dinner he felt the ſtrangury return, he made ſeveral ineffectual attempts to empty the bladder; he went directly to the houſe of the gentleman who had given him relief, who, after letting off a few dry jokes againſt his fellow-ſurgeon, ſet himſelf to work to introduce the catheter; but he occaſioned intolerable pain, and the blood flowed in a full ſtream, ſo that he was forced to let his patient depart unrelieved. So great was the pain he now felt, that he was obliged to go directly home and ſend for his ordinary ſurgeon, ingenuouſly related to him the whole adventure, and this gentleman, who had ſo entirely failed in the morning, relieved him now by introducing the catheter without the ſlighteſt degree of pain or hæmorrhagy."

I am ſorry to ſay that Petit is at great pains to prove that the tumidneſs of the cervix veſicæ was the cauſe of this difficulty, and the unloading of it by this free evacuation of blood, was the immediate cauſe of the catheter paſſing, after each hæmorrhagy, with ſo much eaſe. The inference he draws from this reaſoning is comparatively ſober and ſenſible, viz. that before paſſing the catheter, the patient ſhould be freely bled in order to relieve this engorgement of the cervix veſicæ. But I fear that often the caſe has been quoted in quite another ſenſe, and in vindication of a very common fault. If I am right in my conjecture, or have preſented to my reader a true plan of the direction of the catheter while paſſing the bulb of the urethra, the alternate ſucceſs of theſe ſurgeons muſt be very differently explained;—when blood flowed ſo profuſely, it was by the point of the catheter burſting through the cellular ſubſtance of the bulb; and the fact ſhould have been thus ſtated:

" Whenever theſe ſurgeons (equal to all appearance in unſkilfulneſs) forced the catheter ſo as to bring blood, they could not ſucceed in drawing off the urine, becauſe the catheter had forſaken the courſe of the urethra, and WAS BURIED IN THE CELLULAR SUBSTANCE OF THE BULB! When they had the good fortune to draw off the urine eaſily, no blood flowed, becauſe the catheter WAS IN THE CANAL OF THE URETHRA, AND THE CELLULAR SUBSTANCE OF THE BULB WAS NOT TORN!"

The effect of a tale, in lecturing or writing, is good, for it fixes in the memory any important maxim or rule of practice; but the import of the rule that is to be thus imprinted on the memory, ſhould be an object of ſerious conſideration: the teacher ſhould aſcertain, by deliberate reaſoning, the import of the fact which he is to record by ſuch an illuſtration.

What is the obvious tendency of this tale, ſo often told? to make young men think lightly of this accident! to make them believe that the moſt profuſe flux of blood proceeds from no uncommon injury of the parts! to render them indifferent to the moſt manifeſt marks of their own incapacity and raſhneſs. They who repeat this tale as a vindication of what too often happens, muſt believe that bleeding, from the thruſting in of the catheter, does no harm; that they may perſevere in their attempts to puſh it ſtill deeper; that it is good for the patient to bleed! But the driving the catheter thus into the cavernous body of the bulb, is in my opinion a matter of too much importance to be made the ſubject of a jeſt or merry tale: it may happen, and often does, in the hands of the beſt ſurgeons; but every ſkilful ſurgeon will regret the accident. Surely, if a man unconnected with our profeſſion were to read ſuch a tale as that which Petit has related, he might at the leaſt be permitted to ſay: " It is death to us, gentlemen, although it is play to you."

It has been my fortune, in conſequence of my connection with the young men ſtudying in this univerſity, to be preſent at many awkward ſcenes of this kind; and I am by much experience perſuaded that ſuch a profuſe bleeding is often cauſed by awkwardneſs, where a very ſlight degree of ſkill would enable the ſurgeon to paſs the catheter with eaſe. This, I declare, has happened to myſelf innumerable times; I have been called to a young man, who, from ſitting at table with his idle companions and drinking to intoxication, while his urethra was inflamed with gonorrhœa, has been very ſoon and moſt effectually ſobered by the natural puniſhment of ſuch imprudence:—I have found him ſtalking about his chamber, grinding his teeth in agony, and blood ſtreaming from the urethra, in conſequence of the

mal-adroit attempts of his fellow ſtudents to introduce the catheter. Yet in ſuch caſes I have introduced the catheter with perfect eaſe; and very often it has happened that, the ſtrangury returning in the afternoon, I have been called to the patient, or he has come to me a ſecond time, the blood again ſtreaming from the penis in conſequence of a ſecond attempt by his fellow-ſtudents to perform that operation, which, when performed before them, ſeemed ſo eaſy; and I have on the ſecond time paſſed the catheter as eaſily as at firſt. I have thus, in repeated inſtances, paſſed the catheter with eaſe where the alternate trials made by his friends and companions have produced, in place of relief, nothing but pain and hæmorrhagy. But it no more entered into my imagination that I had ſucceeded only becauſe their attempts had been rude and followed by hæmorrhagy, than that they had failed only becauſe I had been too gentle, and brought no blood.

OF THE VARIOUS CAUSES OF OBSTRUCTION OF URINE; AS STRICTURE, STONE, INJURY OF THE PARTS FROM BLOWS, &c.

OF STRICTURE.

The ſtream of urine ſmall and tortuous, even in the ſound ſtate of the parts, impreſſes us naturally with an erroneous conception of the ſize of the urinary canal. Mr. Home, having injected it with wax, was ſurpriſed to find the roll which repreſented the urethra, ſo large; and I myſelf, when I made the drawing of the urethra, which is in this volume, could hardly believe my drawing at all correct or faithful; for the urethra, though corrugated in the living, is, when expanded in the dead and diſſected parts, full half an inch broad. This canal, made for dilatation, is full of rugæ; and the bigneſs of the ſtones which paſs along the canal, and the ſize of the catheter which it receives with eaſe, intimate to us its natural dimenſions and peculiar conformation, which is ſuch as to enable it to dilate into a large ſac, wherever the paſſage is obſtructed by a ſtone or ſtricture, and the urethra is forced by the propulſive power of the bladder.

It is to no peculiarity of organization, that I would aſcribe the diſeaſe we call a ſtricture of the urethra: I aſcribe it neither to the rugous form of the internal membrane, nor to the muſcular and contractile power with which the whole canal is ſuppoſed to be endowed; though the fact of an occaſional or ſpaſmodic ſtricture, ending in permanent diſeaſe, ſeems to argue this very ſtrongly. As the tumor, which is a wart on the ſkin, is a pile when growing near the anus, or a polypus when in the paſſages of the noſe or throat; ſo that vaſcular action and thickening of parts, which externally would form a tumor, forms a ſtricture in any hollow tube; and the ſtricture is ſtill the ſame, whether it form in the throat, rectum, urethra, or prepuce. This very frequent affection of the prepuce, viz. a proper ſtricture of the part, will illuſtrate in ſome degree the cauſe of this diſeaſe in the urethra. When from any cauſe it happens that the point of the prepuce is kept in a ſtate of irritation, when from the natural cloſeneſs of the prepuce, from uncleanlineſs, from the irritation of mucus in advanced years, from walking or riding much in coarſe clothes, (while a natural tightneſs of the whole prepuce cauſes the point of it to project and receive that friction,) inflammation of the outer circle or ring of the prepuce takes place; and when from ſuch a cauſe an active ſtate of the veſſels commences, a growth, or in other words a thickening, from the increaſing depoſition of parts, begins; thence ſtricture ariſes, and ſtricture once begun cannot but increaſe. This ſtricture of the prepuce is marked by a tumid ring, as hard and firm as the ring of a peſſary, perfectly white, as the ſtricture of the urethra is found upon diſſection to be white; and I have never ſeen this ſtricture of the foreſkin fail to increaſe, and that very rapidly, till an operation was required: in many of the caſes I have ſeen, the point of the prepuce was cloſed, ſo that the urine was daſhed about in an irregular ſtream; and once I ſaw the foreſkin ſo contracted, that the prepuce was converted into a bag almoſt cloſe! the opening in the prepuce bore no manner of proportion to the opening of the urethra, and conſequently the bag filled every time the bladder was emptied! the orifice of the prepuce was ſo extremely ſmall, that I proteſt I could not ſee it; and the obſtruction was attended with this ludicrous circumſtance, that the man who ſuffered from this ſingular ſtricture, being a cobler, was obliged every time he wiſhed to paſs his urine, to thruſt in the point of his awl into this little hole, and dilate it till the opening allowed the urine to paſs. If ſuch ſtricture be a common diſeaſe of the foreſkin, who will venture to ſay that muſcular fibre is alone ſubject to ſtricture, or that the rugous form, or glandular ſtructure of the urethra, throat, or anus, is eſſential to its formation? Let

thoſe, who aſcribe ſtricture to muſcular paſſages alone, think of that ſtricture or contraction of the palm of the hand, which we frequently ſee in people of every deſcription, which hardens the ſkin and tendons, and draws up the fingers like a bird's talon; a ſtricture unaccompanied with pain, frequent in various ranks of life, but ſo peculiarly frequent with mariners, that often one-third of a ſhip's company will be affected with the malady, inſomuch that it ſeems peculiar to certain ſhips. It is a ſtricture from which ſo many thouſands are at this moment lame, that the cauſe and cure is well worth the attention of profeſſional men. Stricture is tumor, and, as a tumor, muſt perpetually increaſe while the circulation ſurvives in the part, unleſs a total adheſion of the canal, by obliterating the cavity, put an end to the action. "When in a ſmall degree, (ſays Mr. Home,) this contraction appears, upon examination after death, to be ſimply a narrowing of the canal at that part; but, when the contraction is increaſed, it *becomes a ridge, projecting into the canal.*" Page 21.

Thoſe who have been troubled with an occaſional or ſpaſmodic ſtricture of the urethra, have every reaſon to fear that it will become permanent: Yet I have often obſerved ſtricture to be merely ſpaſmodic, and I think I have found it often a ſort of febrile diſeaſe. The ſtricture I ſpeak of is more frequent in winter, ariſes from cold, is attended with fever, and is more eaſily cured by any thing than the bougie, which but aggravates the complaint. This febrile ſtricture I have frequently cured in men of the moſt chaſte and exemplary lives, free from the ſlighteſt pollution, married, and of intelligence much above any kind of ſecrecy, where they were once pleaſed to give their confidence, men who never were diſeaſed. The fit of obſtruction is preceded by head-ach, languor, and liſtleſsneſs, while the obſtruction continues; and the acceſſion of the hot ſtage, which comes on in the evening, and eſpecially the paroxyſm of perſpiration, which comes on during the night, is generally a forerunner of relief. I have ſeen the obſtruction ſo complete that not one drop of urine has paſſed, though accompanied with a degree of deſire which urged the patient to place himſelf in the poſture every quarter of an hour, and with ſuch violent ſtraining as produced a partial erection of the penis, whence always the obſtruction became complete, though not ſo before; the bougie being at the ſame time reſiſted at a ſingle point as fairly as if the ſtricture were permanent and organic. I have gone to ſuch a patient at midnight, with catheters and bougies, reſolving to relieve him from the diſtenſion of the bladder: yet feeling a degree of reluctance at uſing harſher means, I have, by ordering a ſharp emetic,

followed up by a ſtrong doſe of laudanum with hot wine and water; by rubbing the perinæum very hard at the ſame time with camphorated mercurial ointment; and by fomenting the lower part of the belly, if neceſſary, with a hot ſtimulant fomentation, or wrapping the parts in a large poultice, been ſaved from doing any thing painful, and have been rewarded for my patience and prudence, by ſeeing the urine diſcharged freely next day, and continue to flow in a full and eaſy ſtream.

I have, after a ſcene of this nature was over, found the bougie paſs with perfect eaſe into the bladder, and have the pleaſure of knowing that many who have been alarmed with theſe ſymptoms have continued for years free from organic diſeaſe, though thus affected from ſpaſm.

The ſudden and total obſtruction which I have juſt deſcribed, is often ſeen in the concluſion, but rarely in the commencement, of proper ſtricture, which uſually betrays itſelf by little accidents, and ſymptoms not at all diſtreſſing. The patient, who has a real ſtricture, whether from venereal complaints, from exceſs committed in warm climates, or from any accidental cauſe, is far gone in this malady before he is conſcious of it. He is firſt thoroughly alarmed by a ſudden interruption of his urine, when, having ſat at table with his friends, he has allowed the bladder to fill beyond its natural and eaſy condition; for that ſtraining which accompanies overfulneſs of the bladder, cauſes a ſtate of half erection of the penis, the cellular ſubſtance thus filled with blood, compreſſes the canal of the urethra, and aggravates any latent ſtricture, till the urine is actually interrupted. The patient, the more he ſtrains, feels the difficulty the more; he but increaſes it by ſtraining, and now obſerves in a particular manner the ſmallneſs and the ſpiral form of the ſtream of urine; from this unfortunate hour his ſituation attracts his attention, and his diſeaſe encreaſes; he recollects that at times, eſpecially after coition, he has had ſuch a degree of running for three or four days as has ſometimes inclined him to believe himſelf infected with gonorrhœa; he has felt occaſionally ſlight pain in the urethra, accompanied with very frequent deſire to paſs urine, which he is in the cuſtom of diſcharging every three or four hours. He now remembers that for ſome time he has been forced to riſe, according to the quantity he drinks at ſupper, three or four times during the night; and all this he would willingly aſcribe to ſpaſm, becauſe organic ſtricture is indeed always accompanied with ſpaſm; the difficulty of making urine, far from being permanent, returns in paroxyſms, is aggravated by cold, increaſes in winter, and in ſummer almoſt

diſappears, is eaſy while the patient is in a warm chamber, is abſent almoſt entirely when he perſpires, returns upon expoſing himſelf to the air, and thoſe paroxyſms, which laſt three or four days, proceed uſually from changes of habit, ſo ſlight, that he can hardly mark the cauſe. But this running like a gleet, returning, upon uſing venery, accompanied with irritation, but never arriving at the virulence of a clap; this occaſional difficulty of paſſing urine and the frequency of the deſire to paſs it, are among the moſt certain ſigns of incipient ſtricture, which ends at laſt, ſometimes in the courſe of a few months, (though often it is delayed for years,) in unequivocal diſeaſe.

This ſcene of ſuffering once begun, is renewed from time to time. The running and the deſire to paſs his water increaſes every time he attempts coition, and he is threatened with abſolute and total obſtruction every time he drinks hard or rides a hunting, or travels poſt, expoſes himſelf to cold, is ſeduced into debaucheries, or any way interrupts the quiet tenor of his life; and when ſtricture is thus confirmed, it is accompanied with new and unequivocal ſenſations, for along with urine the ſemen is obſtruction, coition is attended, in the moment of ejaculation, with a ſpaſmodic action of the accelerator muſcle, creating a ſharp and thrilling pain; though the ſenſe of emiſſion is complete, the point of the penis continues dry; the ſemen recedes into the bladder, and ſometimes is obſerved to flow along with the urine: in this ſtate of things barrenneſs is one conſequence of the obſtruction, though it be in ſuch a degree only as retards, without entirely preventing, the rapid ejection of the ſemen.

Betwixt that obſtruction in which the urine is forced off drop by drop, with violent ſtraining, and that in which the bladder is entirely obſtructed; the limits are extremely narrow, the ſlighteſt imprudence, the being unavoidably expoſed to cold and moiſture, will ſuddenly bring ſuch a patient (like one labouring under hernia) into extreme peril; for after the obſtruction has paſſed a certain point, no ſtraining will force off one drop of urine; nothing but the introduction of the catheter can give relief, and it is not in every village that aſſiſtance can be procured. If the ſurgeon arrives but a little too late, the bladder is diſtended to its utmoſt pitch, and far beyond its natural ſize, the toſſing and uneaſineſs is very great, the abdomen begins to be inflamed, the pulſe is quick, the tongue parched, the lips black, the eyes inflamed, the viſage pale and ghaſtly; and the patient, after twenty-four hours of inſenſibility, or of low and muttering delirium, expires. Thus, in villages and parts remote from help, many valuable lives have been loſt; and when in this

doubtful ſtate, not apparently ill, yet bordering on the greateſt dangers, no officer can go to ſea, no ſoldier can go into ſervice, no country gentleman can retire to his eſtate, without extreme hazard.

Without moſt culpable imprudence the diſeaſe is rarely fatal, but the patient, by the natural courſe of things, falls, if neglected, into a moſt miſerable and loathſome condition; for, from the moment that the obſtruction is nearly complete, the portion of the urethra which lies behind the ſtricture is expoſed to the whole force of the bladder and abdominal muſcles, it is ſoon affected, as an artery is in natural aneuriſm, (i. e.) it is firſt dilated, then inflames, then burſts, then the urine ſpreading (as yet not widely) among the cellular ſubſtance, cauſe indurations of a ſingular hardneſs, as if they were rather knots of callus, gathering round a fractured bone, than inflamed cellular ſubſtance ſurrounding a breach in this thin and delicate tube. Such thickening excited by the urine, forms but a ſlight and temporary barrier to the ruptured part of the urethra; the knot extends and grows, it becomes red on the ſurface and ſoftens, it ſuppurates with little pain, and burſts ſlowly; but when it burſts, the urine iſſues through the opening, the abſceſs ſpreads in various directions; the ſurrounding parts are all affected; the patient often loſes, from mere irritation, the power of retaining his urine, the ulcers and fiſtulas become foul and ſloughy, the linens and the bed are inceſſantly moiſtened with urine. The patient is exhauſted with fits of inceſſant vomiting, and is ſhaken by paroxyſms of fever, apparently peculiar to this diſeaſe, ſuch as make his teeth chatter and the bed ſhake under him during the cold ſtage, and when the ſweating comes on, the ſheets and bed-cloaths, the bed, and even the mattraſs, are ſoaked with perſpirations, and the ſmell of his room reſembles that of a Ruſſian bath. If in this condition he be neglected but a few weeks, or unſkillfully treated, if that fever is combated with bark and emetics, which ceaſes only when proper ſurgical inciſions are performed, if the obſtruction is left untouched, and the ſinuſes unopened, and the matter permitted to work its way deeper among the cellular ſubſtance of the pelvis, the patient ſinks gradually lower and lower, loſes all deſire for food, has a cadaverous and jaundiced aſpect, faints when lift out of bed, and at laſt dies.

If theſe be the diſmal conſequences of this kind of obſtruction, how great muſt be our debt of gratitude to thoſe who have diſcovered a method of cure, or who have improved that method by their ingenuity or diligence. Let it not ſtand as any impeachment againſt Mr. Hunter or Mr. Home, that the uſe of cauſtic and of lancets for piercing ſtrictures are mentioned in the notes of La Faye, and in other

books of the laſt century; ſuch methods were in thoſe times never uſed boldly, ſeldom I am perſuaded, ſucceſsfully. But theſe methods which the old maſters in ſurgery hardly dared to mention, and which have been long neglected and forgotten, have been of late years revived and uſed with a dexterity, boldneſs, and ſucceſs, ſuch as to ſave thouſands from a moſt miſerable death; whatever reward the good opinion and confidence of the public may aſſign to thoſe who have by experience and ſkill improved this department of practice, another and more gratifying reward is alſo due, I mean the thanks of our profeſſion, which I, of all its members, am the leaſt inclined to withhold. Mr. Hunter was one whoſe diligence and genius kept an equal pace, and whoſe improvements in the doctrines of adheſion in the operation of femoral aneuriſm, and in the uſe of cauſtic in ſtrictures, ſhould be thankfully acknowledged; and when Mr. Home writes of ſuch a man with pride and enthuſiaſm, he deſerves every praiſe. Mr. Home's introduction to the laſt edition of his book on ſtrictures, is modeſtly and prettily compoſed, it is ingenious in regard to facts, and ſelf-denying in regard to his own merits, which are not ſlight in ſtriving, as he had done, againſt the prejudices of the learned and unlearned; and it is generous in all that relates to the character of his departed friend; it is, in my opinion, an honour not "leſs to the dead, that are already dead, than to the living that are ſtill alive." While I reſerve the privilege of doubting or diſputing with unlimited freedom, particular theories, or even facts, I ſubſcribe to his eulogium, to "his tribute of gratitude, to the memory of Hunter," with a ſincere pleaſure.

Stricture is a tumor or growth, and the ſtriking a firm bougie into the ring, and wedging it there, can do nothing but excite the action, by which the ſtricture is produced. I have ſeen the patient under the old regime, endure much torture, and with wonderful fortitude. The wedging the bougie into a ſtricture, recalls all the feeling to that part, and excites an inexpreſſible deſire to paſs the water, to retain the bougie half an hour at firſt uſing it, is impoſſible; the irritation does not ceaſe when the bougie is withdrawn; after the paſſages are inflamed the mucous flux is encreaſed, the deſire to paſs urine becomes extremely urgent, if the urine paſſes more eaſily at firſt, the relief is but momentary; never can the patient feel relief till after he has learnt to endure the bougie for hours, and continued to wear it for months. To live thus for months or years, is but protracted miſery; and to ſee the ſtream of urine gradually leſſen at every intromiſſion of torture, and to be ſenſible that the diſeaſe, never cured, tends inceſſantly to return, make

the patient deſperate, and he feels that life is not worth holding on ſuch terms. It is this ſtate of protracted torture and diſappointment that affects ſo viſibly, the phyſiognomy, temper, and general health of a patient who has ſtricture; it is this that produces the chagrined countenance, ſallow complexion, and waſted habit; and often it happened, while bougies were uſed, that falſe routes were produced by the irregular preſſure of the point of the bougie, cavities were formed by the ſides of the canal, and the canal itſelf well-nigh obliterated by this new cauſe of compreſſion; the bougie paſſing thus into the cellular ſubſtance by the ſide of the ſtricture, the urethra behind the ſtricture, diluted under the force of the bladder, and the parts fell into a complicated ſtate of diſeaſe.

With this long ſuffering and ill ſucceſs, let us contraſt the effects both immediate and ultimate of the cauſtic bougie. When the cauſtic is preſſed againſt the ring of a ſtricture, none of thoſe ill conſequences predicted by theoriſts, ever are produced; there comes over the patient a confuſion and a ſort of alarm ariſing from the novelty of the ſenſation, which makes the moſt vigorous and hardy man tremble like a hyſterical girl, and ſhiver for ten minutes with the pale and contracted viſage of one in terror. Yet the patient is not in a ſtate of ſuffering; he talks all the while freely, and feels neither any deep ſenſe of burning, or any other deſcription of pain. Nor is there any thing of that immediate inflammation and ſwelling which it was ſo natural for the theoriſt to predict, which it was ſuppoſed would infallibly cloſe the canal, and entirely ſuppreſs the flow of urine, at leaſt for a time. There is indeed very often, a hæmorrhagy, but it is of that kind which has been thought ſo ſlightly of, when it flows from introducing the catheter; and in the preſent caſe alone is ſuch hæmorrhagy deſirable; for, as it is a ſign of the cauſtic having penetrated to the cavernous body of the urethra, it is a ſign of ſucceſs. Neither does the effect of the cauſtic extend along the canal, nor operate, except on that point againſt which it is preſſed; the ſwelling even of the burnt part is not perceptible; the mere act of touching the ſtricture with the cauſtic, inſtantly gives a degree of relief; for the cauſtic KILLS what it touches; there is no intermediate ſtate of inflammation; the part ſhrinks, and the opening, though affected but in a trivial degree, is actually and inſtantly enlarged; in ſhort, THE NAME ONLY OF CAUSTIC IS ALARMING *.

The bulb of the urethra is a natural dilatation of the canal, fit for receiving the

* For a very ludicrous denunciation of dangers to be apprehended from cauſtic by half a dozen of grave and learned doctors and profeſſors, ſee in Mr. Home's book on Strictures, page 5.

ſemen, which is poured into it during coition, and ejected from it by the ſmart action of the accelerator muſcle, in the moment of emiſſion. Immediately behind this dilatation or ſac of the bulb, the urethra, where it enters the bulb, is naturally narrow, and joins the bulb with ſomething like a ring, or natural ſtricture; and it is here, at this point naturally ſtrait, that the ſtricture is formed; a ſecond ſtricture is often found a little beyond this point, about half an inch nearer the neck of the bladder: and whether there be one or more ſtrictures, they lie ſo far down in the urethra, that one, unaccuſtomed to introduce the bougie, would believe that he had paſſed it along the whole canal, and that it had entered the bladder; and when he feels reſiſtance, he would ſuppoſe it to ariſe from the natural ſtraightneſs of the proſtate gland; if there be other ſtrictures than thoſe near the neck of the bladder, they are uſually in the penis, often about the middle, very commonly in that part of it from which the ſcrotum hangs.

It is the number of ſucceſſive ſtrictures that makes the moſt formidable reſiſtance to the paſſage of the urine, and cauſes the moſt cruel diſappointments in the cure; for the firſt ſtricture, that neareſt the bladder, receives almoſt the whole contractile force of the bladder and abdominal muſcles; the ſtream of urine, if there were but this ſingle ſtricture, would be ſmall thread-like, and tortuous; but the force of the bladder being entirely ſpent upon the firſt ſtricture, the ſtream reaches the ſecond with ſo little impetus, that it is quite broken, aud the urine falls away from the point of the urethra without impetus, drop by drop; and I hold this peculiar manner of paſſing the water, as a mark not ſo much of the cloſeneſs of the ſtrictures, as of their number and ſucceſſion, as a ſign of a conſiderable extent of the canal being diſeaſed; for I have obſerved wherever an extent of the canal is affected by fiſtulous ſores, in the cellular ſubſtance of the urethra, the ſame flowing of the urine, without projection, drop by drop. The effect is like that which we produce in tying the arteries of a dead body for injection; for though one firm ligature will not entirely reſiſt the preſſure of our ſyringe, two ſlack ones will ſuffice. The effect is in this reſpect unfortunate, that ſuch reſiſtance excites the whole force of the bladder, which, by being imperfectly emptied and thrown into frequent and violent action, has its coats thickened, its cavity contracted, it becomes irritable, ſo as to contain but a ſmall quantity of urine, and that not eaſily, whence even the removal of the ſtricture (the bladder remaining thus contracted) makes but an imperfect cure. A perſon unacquainted with this department of practice, having applied his cauſtic, and at laſt plumped his bougie

unpremeditately and ſuddenly through a complete ſtricture, would be apt to triumph, but the urine flows not a whit the more eaſily; and upon introducing a bougie as a probe, the ſecond ſtricture is diſtinctly felt.

There is no other evidence of the exiſtence of permanent ſtricture but the bougie, nor is it even a very abſolute teſt, I have found the bougie ſtick firm, as if engaged in a ſtricture, which, after the ſpaſm which ſtopped it had ſubſided, has paſſed with perfect eaſe. I have often ſeen the bougie introduced by the patient, and ſo fixed, either by its point hitching upon one of the lacunæ, or by ſome other accident, that no degree of force could have driven it onwards, whereas, upon withdrawing it a little, and paſſing it on in the true direction, or withdrawing it altogether out, and uſing a freſh and firm one a little larger, it has gone on eaſily to the bladder.

When your own, or your patient's ſuſpicions of ſtricture have gone ſo far that you meet with him to decide the queſtion, you firſt make him paſs his water before you, that you may remark the ſize and form of the ſtream; you next take a bougie of a reſpectable ſize, by no means a ſmall one; and, having oiled and bended it ſomewhat in the form of a catheter, you introduce it before it ſoftens; and always, in paſſing the bougie, whether ſimple or cauſtic, you are quick and dexterous in running it up to the conſtricted part, before it begins to ſoften, which it does very ſuddenly, when affected by the heat of the urethra. You proceed thus: you raiſe the point of the penis with the left hand, you then introduce the bougie with the right, and run it on ſuddenly, till having paſſed the ſcrotum and reached the perinæum, you change your left hand from the penis to the perinæum, you preſs in the points of the fingers of your left hand behind the ſcrotum, and run them back along the perinæum, accompanying, as it were, the progreſs of the bougie; and while you puſh the bougie ſmartly on with the right hand, you preſs in the perinæum with the fingers of your left hand, directing the points of your fingers ſo as to turn the point of the bougie directly upwards, before the anus, at the place where you expect to feel the ſtricture. You feel the reſiſtance and aſſure yourſelf of the ſtricture. You ſatisfy yourſelf that the bougie, in place of going onwards, is curling up under the force of the preſſure, you then withdraw the bougie and find it curled like a pig's tail, but with a point not at all ruffled, becauſe it was never admitted within the ring of the ſtricture, ſo as to receive any impreſſion from it. Either now or at ſome future occaſion, you meaſure the ſtricture, by uſing a bougie ſmall enough to enter into it; you take a ſmall pointed and ſtiff bougie, give it

the bend, introduce it after the ſame manner, but inſtead of ſtopping, for fear of giving pain, you preſs it on and wedge it firmly into the ſtricture, where, if it be preſſed but a very little, it takes a hold and is withdrawn again with difficulty, and with a ſort of feeling as if the urethra were inverted by it. Upon being altogether withdrawn, the wax is found ruffled on the point of the bougie, a ſort of ring marks the part embraced by the ſtricture, and the progreſs which the conical point of the bougie had made in the ſtricture, denotes the ſize of the ring.

The application of the cauſtic really and effectually to the ſtricture thus diſcovered, is no eaſy matter. The moſt dexterous apply it ſometimes twenty or thirty times without ſucceſs, while it happens not unfrequently, that the armed bougie plumps through the ſtricture at the third or fourth experiment. Thoſe bougies which are made in London, are certainly the beſt, for they have a long cauſtic ſecurely lodged, and ſufficiently expoſed; yet I make, armed bougies perfectly ſatisfactory to myſelf, by cutting the pencils of cauſtic nicely, introducing the point of a ſharp pen-knife into the point of the bougie, and turning it vertically, till the centre rolls of cloth, of which the bougie is compoſed, are ſcooped out and the outer circle only left; then the cauſtic being lodged in the hollow and the edges of the cloth, of which the bougie is compoſed, folded over it, a ſmall round knob of the cauſtic is left expoſed, and the bougie which had ſoftened under the modelling of the fingers, is laid by to harden; the edges of the plaſter having then taken a firm hold upon the cauſtic.

When the cauſtic bougie is to be introduced, I like to paſs a common bougie before it, liberally beſmeared with oil, not to aſcertain the place of the contraction ſo much, as to lubricate the paſſage, and make the cauſtic glide quickly to the deſtined point. Then placing the patient, and bending the bougie as juſt directed, you (having oiled the point of the urethra, and ſpread its lips that the cauſtic may not, as often happens, touch the point) glide the bougie down nimbly and quickly down the urethra till it is reſiſted by the ſtricture; you then change the fingers of your left hand quickly from the penis to the perinæum, and there, by preſſing them in ſucceſſion, you direct and work on the bougie with the left hand, and prevent it bending, while you force it into the ſtricture with the right; and all this muſt be ſmartly, nimbly, and dextrouſly done, for the bougie ſoon ſoftens and bends, and you have no longer any power over it: having ſtruck the bougie firm into the ſtricture, you keep it preſſed home againſt it for a few minutes; the patient at firſt feels very little indeed, only the ſlight pain of preſſure, which, however together with

the novelty of the ſenſation and the alarm, makes him blanch and almoſt faint, or at leaſt be ſeized with a cold and trembling fit, ſhaking as if in an ague. The pain is nothing compared with the patient's imaginings; though the name of cauſtic ſounds alarming, the ſenſe of burning which it occaſions is very ſlight, the bougie, after a few minutes, is withdrawn, and the ſlight irritation occaſioned by it ſubſides.

There ſometimes accompanies the application of the cauſtic, a ſlight tinge of blood, a degree of ardor urine, an increaſed deſire to paſs the urine, but indeed the pain and irritation is ſo ſlight, that the patient is contented and eaſy in his mind, and his urine flows more freely than before; he is at all events freed from that apprehenſion which he could not but feel when he thought of having a cauſtic bougie paſſed into the yard. But the ſtream of urine which was a little enlarged by the firſt application, becomes ſmaller again, the cauſtic is again applied, and on the fourth or fifth, or perhaps the eighteenth or twentieth application, ſooner or later, it paſſes through the ſtricture, and the urine, if there be no ſecond ſtricture, flows with perfect eaſe.

The young ſurgeon, in the courſe of his practice, will obſerve and be perhaps alarmed with ſeveral unexpected circumſtances. Firſt, he will ſometimes be alarmed with the apprehenſion of the cauſtic having dropped from the end of the bougie, and often it does actually excoriate a great length of the canal, but the worſt conſequences produced even by this accident, are an unuſual degree of irritation in the courſe of the canal, running, as in a ſmart gonnorrhea of thin and bloody ſerum, a heat of urine, ſlight pain in the perinæum, and ſometimes ſlight pain in the teſticle. I have ſeen large flakes of the lining membrane of the urethra diſcharged along with the bloody ſerum; but the worſt of theſe ſymptoms ſubſide, and in a few days the cauſtic can be applied again. Secondly, he will be ſurpriſed to find, when he chooſes the largeſt cauſtic bougie in order to make ſure of the effects of his cauſtic, that it has actually no effect, for though a large bougie expoſes a greater ſurface of the cauſtic, that ſurface does not come in contact with the ſtricture; a ſmaller bougie is more fairly admitted into the ring of the ſtricture, and has, according to my obſervation, a much happier effect. Thirdly, he will be ſurpriſed with the rude and unuſual ſenſation the bougie conveys to his finger when paſſing through the ſtricture; for at that particular application in which it paſſes through, there is no determined interruption! but in the moment when the bougie approaches the neck of the bladder and is paſſing

through the cauterized ring, it is felt to grate along as if it were paſſing through a ſhot hole in a rough deal board. Fourthly, he will ſometimes be alarmed even by the happieſt preſages; for often there comes on ſo profuſe a hæmorrhagy, that, inſtead of urine, nothing but blood ſeems to run from the urethra, in a full ſtream, as freely as from a vein in the arm, hanging in coagula from the point of the yard. Yet ſuch hæmorrhagies imply nothing but ſucceſs, for they ariſe from the ſloughs having deſtroyed the ſtricture, and penetrated into the cavernous body of the urethra: a profuſe hæmorrhagy, while it is actually harmleſs, is a prognoſtic of a ſpeedy cure.

The horror and ſhivering which the patient, though ſuffering neither fear nor pain, cannot ſuppreſs; a ſhivering ſo violent as to make the teeth chatter audibly, is no ſign, as far as I can diſtinguiſh, either of ſafety or danger, of ſucceſs or failure; but, if any thing, it intimates the ſucceſsful application and action of the cauſtic, for in the ſame patient I do not find the ſame paleneſs or trembling upon introducing the common bougie *. I have ſometimes on the evening after applying the cauſtic, found my patient vomiting from the nervous affection, and ſometimes I have ſeen him, after a long fit of ſhivering, ſlightly delirious, without any perceptible fever. The ſickneſs and delirium reſemble thoſe from intoxication. The ſickneſs of ſo unuſual a kind, that the patient has not time to ſtretch out his hand for the baſon, and the delirium or confuſion of the head accompanied like than of drunkenneſs, with particular ſtupor. Fifthly, the young ſurgeon will be often ſurpriſed to find, while he is deſpairing of ſucceſs, that his patient informs him of his cure, of having paſſed his urine freely and in copious ſtreams, and eſpecially he will be ſurpriſed when informed that the flood of urine has puſhed on before it a ſtone of conſiderable ſize. But in truth, ſtones are often formed behind a ſtricture, from ſmall particles of gravel ſticking there and accumulating; and when the ſtricture is deſtroyed the ſtone paſſes and drops into the water-pot the firſt time the urine is freely diſcharged. The ſurgeon and patient are alarmed at the firſt, by every unuſual ſymptom, are ſoon reconciled to the uſe of the cauſtic, then become familiar, and are at laſt doubtful of any effects bad or good from this application; but a ſurgeon experienced in the uſe of it is not diſmayed, although he perceive no effect after many applications. The bougie often ſtarts unexpectedly through the ſtricture, the fifteenth or twentieth time it is applied; it has been

* In the time of injecting a hydrocele with port wine, or of cauterizing a ſtricture, I have ſeen repeatedly the ſtouteſt man fall back, become pale, and faint like a girl.

applied forty times by the moſt ſkilful without effect, and has at laſt ſucceeded. To mention thus the occaſional circumſtances which accompany the cure is perhaps the ſureſt way of preventing alarm and enſuring ſucceſs.

OF FISTULA IN THE PERINÆUM AND URETHRA.

From theſe ſimple obſtructions I proceed to deſcribe more complicated ſcenes of diſtreſs, ariſing not ſolely from ſtricture, but from any cauſe obſtructing the urinary canal: for whether a ſtone ſticks in the urethra, or by a blow on the perinæum ſwelling and inflammation is produced, whatever cauſe prevents the urine from paſſing freely expoſes the urethra behind the obſtruction, to be dilated, inflamed, ulcerated, or even burſt by the force of the bladder.

It is not to be told what difficult and perplexing forms this complaint aſſumes, how anxious, careful, and curious, the ſurgeon's enquiries muſt be before he can underſtand the extent, form, and other circumſtances of any particular fiſtula; I ſhall therefore be at pains, both by my arrangements and deſcriptions, to give the young ſurgeon clear conceptions of this diſeaſe.

There are three general caſes which demand eſpecial attention:

Firſt, The obſtruction of urine proceeding from ſome violence to the perinæum, from a blow, a fall, or other accident by which, though the ſkin remains entire, the urethra itſelf is lacerated, and the urine, obſtructed in its natural paſſage, burſts, along with the extravaſated blood, into the cellular ſubſtance of the ſcrotum and perinæum, and makes external openings by cauſing a gangrene of the parts.

Secondly, The canal obſtructed by the ſudden impaction of a ſtone in it. The caſe ill underſtood, and the urethra expoſed to the force of the bladder by which it is dilated into a ſac, in which the original ſtone is gradually augmented in ſize, while other ſtones are often generated.

Thirdly.—The fiſtula ariſing ſometimes from ſtricture; ſometimes from venereal or ſcrophulous ulceration, which, in its progreſs, is accompanied with a ſucceſſion of abſceſſes, various openings through which the urine is diſcharged, and extenſive indurations of the ſurrounding cellular ſubſtance; till at laſt, the perinæum and ſcrotum, perforated at various points and diſcharging urine, pus, and flatus from the putrid cellular ſubſtance, reſembles in its livid and indurated form the integu-

ments covering a diſeaſed bone, while the patient is waſted with ſucceſſive paroxyſms of fever and pain; by want of reſt, and by the uncleanlineſs and offenſive ſmell. Let theſe ſlight definitions ſerve to indicate the chief ſubjects of the following diſcourſe.

The membrane of the urethra is delicate and eaſily ruptured, and the cellular ſubſtance ſurrounding it is like a vein full of blood continually circulating in it. The urethra itſelf, or the cellular ſubſtance of the urethra, is often burſt by a blow or fall upon the perinæum, as in trying to leap acroſs forms or chairs, or ſlipping a foot in croſſing a ſtile; or by maſons, miners, or ſailors, falling from a height and alighting among looſe ſtones, or upon projecting beams, or upon the breech of a gun, or the fluke of an anchor. The urethra, or cellular ſubſtance of the urethra, being burſt by a blow, the blood either flows from the penis, or is extravaſated in the perinæum according to the degree of injury.

When the lining membrane of the urethra alone is burſt by the fall, the blood runs from the penis in a full ſtream to the great terror of the patient, who apprehends the moſt horrible conſequences; but it is like that hæmorhagy which follows the rude introduction of the catheter, harmleſs: the blood flows indeed as freely as from a vein, but it coagulates, and the hæmorhagy ſtops of its own accord: it is indeed renewed by the paſſing of the urine, the clots which are in the urethra being forced off in long ſtrings, or bolted out in ſmall knotty coagula; but it ſtops again! and though I have often ſeen ſuch hæmorhagy proceeding from a venereal ulcer in the urethra bleed thus for three days, and though I have at laſt been obliged to lay a compreſs upon the penis and lay it down upon the belly with a bandage to ſtop the hæmorhagy, I never yet ſaw the patient injured by the loſs of blood.

I have had patients run into my room with their pantaloons filled with blood, but I have ſeldom been obliged to uſe preſſure, to which the whole canal of the urethra, and eſpecially the bulb, is ſo fairly expoſed, that no harm can ever happen. When blood flowing along with the urine comes thus from the cells of the urethra it flows in a ſtream; and when coagula are formed they are long, ſlender, and ſtringy; but when the blood flows, as I have ſeen it, from the kidney into the bladder, or from the ulcerated ſurface of the proſtate (a part which is ſurrounded with a plexus of veins), the clots are very condenſed, round, and firm; they obſtruct the urethra and neck of the bladder ſo that the force required for their expulſion is very great; the patient, every time he paſſes his urine, ſtalks about his room in all the agonies that thoſe feel who have actually

the ſtone; and when, after many efforts, the clots are propelled through the urethra, they bolt out to a great diſtance.

When the blow is very violent the bulb of the urethra is completely burſt, blood flows from the penis in great profuſion, and a tumour is obſerved in the perinæum ariſing from the ſame extravaſation of blood. The extravaſated blood, like that of an aneuriſm, makes a rapid progreſs among the looſe cellular ſubſtance of the ſcrotum, which ſwells ſometimes to the ſize of a child's head. The blood is puſhed forward alſo under the ſkin of the penis, till the ſwelling of the prepuce entirely hides the glands; and the blackneſs extends upwards over the belly and down the thighs. A ſurgeon well acquainted with the ſtructure of the parts, even though not ſkilled in this department of practice, will eaſily perceive that the urethra is burſt, and will no ſooner ſee blood effuſed and an extending cochymoſis, which is comparatively harmleſs, than he will apprehend, next an effuſion of urine into the cellular ſubſtance, which is full of danger; and, the moment he ſees an effuſion of urine, he will make no delay but perform thoſe inciſions which are neceſſary to ſave the parts, eſpecially the ſkin of the perinæum and ſcrotum from deſtruction. When the patient feels the ſenſe of paſſing urine ſo diſtinctly that he cannot be perſuaded that it is not paſſing, but by ſeeing the point of the penis dry; when the ſcrotum and perinæum, which were at firſt ſwelled and livid, become puffed up ſuddenly; when the ſwelling, which was at firſt firm and reſiſting, becomes ſoft and gives a crepitating feeling, and eſpecially when no urine paſſes, and yet the patient feels the uſual relief, the ſurgeon may be aſſured that the urine is paſſing into the cellular ſubſtance; that the parts will ſoon fall into gangrene; that the teſticles, and perhaps the penis, will, by the ſloughing of the ſkin, be left naked and expoſed, and the ſkin of the perinæum partly or entirely deſtroyed. Theſe are moſt dangerous circumſtances, and the fate of the patient depends directly and plainly on the talents and diſcernment of his ſurgeon: and there are two modes of proceeding, one of which leads to ſafety and converts a dangerous accident into a very ſimple caſe in ſurgery; the other, of which there are unhappily too many precedents, leads to deſtruction.

If, when the ſurgeon arrives, he is not aware of all the conſequences of the accident; if he do not reflect more upon the effuſion of urine ſoon to take place than upon the preſent difficulty of introducing the catheter; if he calls a conſultation of ſurgeons chiefly to aſſiſt him in the introducing of the catheter, or in conſulting about tapping the bladder! If one or two days are loſt in vain attempts

to introduce the catheter, and in the unmeaning and trivial occupation of applying fomentations, embrocations, and poultices to the parts; the parts fall inevitably into gangrene; and it has actually happened that, while a grave conſultation has been deliberating on the means of drawing off the urine, it has been eſcaping into the cellular ſubſtance and cauſing gangrene; and after gangrene has actually taken place, they have, in a fit of deſpair and to accompliſh they knew not what, tapped the bladder from the rectum; and yet, after all this deſtruction of ſurgery and diſeaſe has been conſummated, the parts have healed in ſo kindly a manner as to prove that nothing was required but a few ſuperficial inciſions to keep the patient in ſafety.

But if the ſurgeon, aware at once of all that has happened, and of all that is to enſue, and of the nature of the danger to which his patient is expoſed, in place of ſtriving to introduce the catheter, which is far from being eſſential to the cure, attends only to the breach of the urethra! If he makes ſuch inciſions in the perinæum as permit the urine to eſcape freely, he will ſave the parts from gangrene: the natural and free paſſage of the urethra will be ſpontaneouſly reſtored, when the firſt inflammation ſubſides: and the inciſions made by the knife will heal in a manner very different from that of broad and gangrenous ſores produced by extravaſation, and connected with the urinary paſſages.

The ſtructure of the parts and uſual conſequences then of this accident being conſidered, the ſurgeon cannot eaſily miſtake what is to be done.

Firſt, no doubt he is to introduce the catheter: it is the moſt obvious and eaſy means of preventing effuſion of urine, and reſtraining the extravaſation of blood: and, if the flexible catheter can be introduced and left in the bladder, it will enſure an eaſy cure. But generally the ſurgeon will find a degree of obſtruction at the ruptured part, which he dares not overcome, and be ſenſible of the point of his catheter lodging in a ſort of ſac. When he is conſcious that he cannot paſs the catheter he will not think of perforating the bladder; if he is to perforate at all, he will perforate the perinæum where already the urine begins to be effuſed, and where his knife will uncover, and his medicines reach, the ruptured part of the canal. He will treat this caſe of effuſion of urine into the ſcrotum and perinæum according to the analogy of air effuſed from the lungs or trachea; i. e. he will take care to provide an exit for the urine which is already effuſed; and he will be careful to ſupport a free oulet for that which may continue to be diſcharged till the natural paſſage for the urine be reſtored by nature or art. With theſe

views he will make ſmall inciſions proportioned to the bulk of the tumour; he will place one inciſion in particular ſo over the ruptured part of the urethra (which he can mark by the ſtopping of the catheter there) as to provide in future free egreſs for the urine: Having relieved the parts thus he will expect the ſwelling to ſubſide ſo far as to allow him ſoon to paſs the flexible catheter along the canal of the urethra. In the meanwhile all is ſafe, and, when he is able to introduce the flexible catheter into the bladder and leave it there, the breach of the urethra heals over it, or will indeed heal without the catheter, if the external wound be not tortuous nor fiſtulous but free and open. No poultice nor fomentation ſhould be applied to parts in this condition: they muſt be moiſtened from time to time with vinegar and ſpirits: they muſt be kept dry and clean and wiped at every time they are ſoiled with urine: the compreſſes dipt in ſpirits ſhould be ſupported with gentle preſſure: the wounds, eſpecially that which is oppoſite to the urethra, ſhould not be crammed with lint or other dreſſings, but dreſſed lightly with gentle eſcharotics, as red precipitate mixed in a ſmall proportion with any ointment. The ſloughing parts (if there has been a great deſtruction of parts) muſt be touched lightly with turpentine, not burnt up by a perpetual application of it; and any edges that become particularly callous may be touched with lunar cauſtic. It is ſo eſſential to prevent ill conſequences that the parts endangered by the effuſion of urine be freely expoſed, that I am earneſt in recommending the practice to my reader on all occaſions of this kind. If he will look into Tollet he will find, that he who was a ſtern old ſurgeon and knew his duty made, what fools will miſname ſurgeon's! work he made free inciſions! and, by cutting the parts, ſaved them: delay in circumſtances like theſe is not gentleneſs but cruelty.

Yet theſe are not caſes of fiſtula: there is no long continued diſeaſe, no callo-ſity, no irregular paſſages through which the urine flows with difficulty; but direct and clean inciſions which ſhould eaſily heal: Nor do I account thoſe ſores to be properly fiſtulous which proceed from ſtones arreſted in their paſſage along the urethra: Yet, when a ſtone ſtops in the urethra and the urethra is dilated behind it in form of a ſac, it is a mere dilatation of the lubricated canal, and the ſurface of the ſac when at laſt it does burſt or is opened is very little diſpoſed to granulate or heal. The ſurgeon who is thoroughly acquainted with the ſtructure of the parts has this unqueſtionable advantage, that, in any given accident, in any complicated caſe, when ſome particular cauſe is producing diſorder and exciting diſeaſe, he reaſons correctly on its conſequences, foreſees all that may happen, and

anticipates whatever ſymptoms it is poſſible to prevent: in the caſe, for example of ſtone either dropping down from the kidney or formed in the bladder, and driven on by the ſtream of urine along the urethra, he will eaſily anticipate the conſequences, or at leaſt underſtand them when they do preſent.

A ſtone, while within the urethra, is puſhed on by the ſtream of urine, but the moment it is delivered from the urethra and lodges in the prepuce the urine no longer urges it forwards; and if the prepuce be narrow the ſtone remains there, and eſpecially in boys, who are unconſcious of the cauſe of their pain and do not ſeek relief, it remains till it acquires an extraordinary ſize. When a ſmall ſtone is thus lodged under a narrow prepuce, the ſtream of urine, being from time to time particularly ſtrong, the ſtone preſents itſelf at the narrow opening of the prepuce, the prepuce then ſuſtains the whole force of the bladder, and is dilated, and, by ſucceſſive dilatations and fits of inflammation, it is made to thicken and grow into a ſac of conſiderable ſize. In a little boy the prepuce has been thus enlarged to the ſize of a French apple, the ſize of the bag and the narrowneſs or ſtricture of its point increaſing in equal proportion, and the ſtone moving within the ſac, like the pea in a cat-call, often preſenting ſo as to obſtruct the urine, and puſhed back by the mother with a pin or bodkin ſo as to give the boy relief by emptying the prepuce. The ſtone has been allowed, from the timidity of parents, to remain for years till it has increaſed from the ſize of a pea to that of a nut, and in men grown in years a ſucceſſion of ſuch ſtones have been formed under the prepuce, one being generated as another was diſcharged. The inconvenience of puſhing ſuch a ſtone back to make way for the urine has been endured for years rather than endure the ſimple operation for the phimoſis, viz. cutting up the foreſkin.

Stones paſſing along the urethra are often interrupted by that narrowneſs of the canal, which is obſervable immediately before the bulb whence they are fixed in the perinæum: often again they are interrupted at the very point of the glans, the orifice being encircled by a ſort of membraneous ring which girds it and makes it narrower than any lower part of the canal. The canal is in all its length betwixt thoſe two points ſo equable in its diameter, ſo lubricated, and ſo dilatable, and the bladder is ſo powerful in its contraction, that the ſtone ſeldom ſtops at any intermediate point, or never longer than a day; during which time the urine paſſes in ſuch quantities by the ſide of the ſtone as to relieve the bladder, while the bladder dilates the urethra, ſo that the ſtone makes its progreſs ſlowly, inſenſibly,

in reſpect of its deſcent, but with great pain. I never knew a ſtone ſtop at any other point than either the perinæum, or the very opening of the glands. I never have found it neceſſary to cut the urethra, nor even to uſe thoſe means, as blowing into the urethra, or dilating it in any other way, which have been ſpoken of ever ſince the days of Proſper Alpinus: in ninety-nine of a hundred caſes, ſtones once enaged in the urethra, paſs along without the help of art; but if they are delayed it is in the perinæum, and it is neceſſary here to tell the conſequences.

When a ſtone actually ſtops in the urethra, it is uſually at the turning of the urethra, under the pubis, at that narrower part where ſtricture uſually occurs. On the firſt day there is a total obſtruction, with intolerable pain, from which the patient has no relief; on the ſecond day the force of the bladder overcomes, in ſome degree, the reſiſtance of the urethra, and urine begins to paſs by the ſides of the ſtone. But while the urethra is ſuffering this preſſure, it is in ſome degree dilated; and if the ſtone be immovably fixed in the urethra, the dilatation increaſes till ſuch a ſac is formed as is capable of receiving the ſtone. Then it rolls back into the ſac and lies there, out of the courſe of the urine, which paſſes at times freely, but at times is interrupted, the ſtone being, by the contraction of the parts, placed oppoſite to the urethra: and thus it happens that the urethra is expoſed from time to time, to the force of the bladder, the preternatural ſac is dilated more and more, and being enlarged much beyond the ſize of the original ſtone, is capable of containing a ſmall quantity of urine. This lateral ſac of the urethra reſembles a ſecond bladder, and other ſtones are formed in it: Now the parts are thickened, the bulk is very perceptible in the perinæum: The patient ſits uneaſily, and ſeldom paſſes urine without interruption and pain: The ſwelling either is in the back part of the ſcrotum originally, or extends that way. The patient, from long habit of obſerving his ſituation, can recollect that often while the urine flows in a full ſtream, he is ſenſible of ſome going into the tumor; and after having paſſed his urine, he can, by ſqueezing the ſwelled part of the ſcrotum or perinæum, preſs out a ſmall quantity of urine extremely fœtid, from being retained in the ſac: often, while the urine is flowing in a full ſtream, he finds it ſtop ſuddenly, from the preſenting of one or other of the little ſtones in the proper courſe of the canal; and that there are ſuch ſtones, he can feel diſtinctly, for as the ſtones are formed in the ſac, and not the ſac moulded upon the ſtones, the ſac is large enough to let them rattle ſo againſt each other, that the patient feels them within the tumor, like thoſe in the crop of a bird.

Having come to have ſome conception of his own caſe, or having been accidentally relieved by the catheter, he learns to keep one in his pocket, and, by introducing it when the urine ſtops, he, by puſhing back the ſtone, gives vent to the urine, and the laſt drops of urine, eſpecially that urine which iſſues from the ſac, are peculiarly fœtid. When ſuch a ſac is opened by an inciſion, ſtones are found in ſome caſes to the number of ſixty or eighty, and the fiſtula is nearly, though ſeldom entirely, cured: why ſuch a ſac is not eaſily cured is obvious, for the formation of ſo many ſtones implies a long continued diſeaſe and calloſity of the parts; the ſac is generated by preſſure, diſtenſion, and ſucceſſive inflammations; there is a remarkable thickening and maſſing together of the parts, and when the tumor is opened the ſurgeon feels, by introducing his finger, that the ſac is ſo ſmooth, ſo lubricated, and ſo perfectly analogous with the inner membrane of the urethra, that it is probably a ſimple aneuriſmal-like dilatation of that canal, ſupported by a thickening of the cellular ſubſtance; and the ſac formed out of ſuch a lubricous membrane is not likely to inflame and heal. The fact is (independent of all reaſoning) that the ſac does not eaſily granulate, but often continues fiſtulous, and requires frequent inciſions, together with eſcharotic applications alternated with poultices, which alternation of ſtimulant and ſoftening applications, keeps all the parts at the ſame time ſoft and ſwelled, and the veſſels in an active ſtate.

Theſe ſacs are not ſmall and thin in their walls, as the dilatation of the canal of the urethra gives the idea of a ſmall and delicate ſac; for no part of the human body enlarges by mere diſtenſion, no part grows thinner as it enlarges. Diſtenſion excites the action of the veſſels; the increaſed action of the veſſels cauſe an increaſed nutrition or ſecretion of parts, and thence parts thicken as they are dilated. The urethra then being dilated, thickens, makes a cloſer connection with the cellular ſubſtance and ſurrounding parts, and the tumor produced is not a mere ſac but a maſſive thickening.

That ever it ſhould be allowed to grow to any great ſize, may appear ſurpriſing, but let us reflect on this, that even external tumors, attended with obvious deformity and manifeſt danger, conſtantly attracting the eye and ſoliciting the attention of the patient and his friends, are diſregarded. This is a diſeaſe, which, from its peculiar nature, will be concealed. Country people are ſo inattentive to their health as not to aſk advice, and ſo ignorant as not to ſuſpect the cauſe of their pain. They have, from their way of life, a coarſeneſs of feeling, a want of ſenſibility, an indifference to all ſlighter inconveniences, and they are remote

from affiſtance; and on the Continent eſpecially, their condition is very little regarded; beſides the ſtone when thus fixed in the perinæum, lies pretty ſolid and occaſions nothing of that extreme pain which it would be attended with if lodged in the bladder; thence it has often happened that a ſtone ſo engaged in a ſac, has been allowed to increaſe for years and attain the ſize of an egg. From its protruſion the tumor is apt to be injured, and from the great ſize and mere gravitation of ſuch a ſtone, the ſac is apt to inflame and ulcerate. Country people have been ſo ignorant of the nature of their complaint, as to go on horſeback with a ſtone thus lodged in the perinæum, whence the perinæum has been ulcerated, and the ſtone projected ſo as to be felt and pulled away with the fingers; and ſometimes ſo violent an inflammation has (without any very particular cauſe) extended itſelf over the whole ſurface, as to terminate in gangrene of the perinæum, ſcrotum, and verge of the anus, the ſtone falling into the water-pot, upon the burſting of the ſloughs, to the great confuſion of the ignorant patient.

Perhaps it may not be irrelevant to mention here, among the diſeaſes of the urethra, an accident which is ſhockingly frequent: little boys who in their dreams wet the bed, have often, to avoid the ſhame and the puniſhment of ſuch a fault, tied tapes about the penis, and, unable to undo the knot in the morning, have concealed their ſituation; and I have known parents ſo fool-hardy as to do this, and have ſeen the penis cut half acroſs. It is always the lower ſide of the penis, or that on which the urethra lies, which ſuffers; and the only remark which I have to ſuggeſt is this, that I have never ſeen any good done by attempts to re-unite the parts at the time of the injury. That the applications of cantharides, red precipitate, and other irritating applications, in place of aſſiſting the re-union, or procuring granulation, have invariably widened the breach. I adviſe that the parts be ſuffered to heal; that if any thing be introduced into the urethra, it be only a leaden probe; and that all attempts at healing the breach, be deferred till the parts are ſkinned over, the inflammation entirely gone, the orifice callous; and then, by paring and ſcarryfying the edges, retracting the ſkin of the penis, ſecuring it by adheſive plaſters, and introducing a flexible catheter, it may be really cured.

Theſe are accidents comparatively rare, to omit the mention of them would indeed be wrong, but to repreſent them as frequent cauſes of fiſtula, would be to deceive my reader; let us turn then to matters of daily practice.

That inflamed, indurated, and confuſed ſtate of the parts, where the urine having

ceaſed to flow through the natural canal, has burſt through the perinæum in various irregular openings, is the work of time, and proceeds from the ſlow operation of ſome continued reſiſtance to the paſſage of the urine: ſtricture, and venereal diſorders of the urethra are the only cauſes which we recognize in common practice. If the interruption of a ſtone paſſing along the urethra, or a blow burſting the canal, produce fiſtula, it is to be regarded rather as an accident, and indeed the diſeaſe is more eaſily cured. Stricture is, in ninety-nine of a hundred caſes, the cauſe of fiſtula; for irritation and frequent deſire to paſs urine is inſeparable from ſtricture, which is continually felt as a foreign body: the frequent contractions of the bladder leſſen its dimenſions, thicken its coats, and increaſe its maſcular power; and thus while the bladder is acquiring daily increaſe of power, and its contractions are becoming every hour more frequent, the urethra is no longer able to bear the preſſure. I do not mean to ſay that the urethra is burſt, as where a ſtone impacted in the urethra totally ſhuts the canal, but it is dilated by the continual force of the bladder, it inflames, the ſurrounding parts are ſoon affected, and thence begins the diſeaſe of the perinæum.

The penis and all the ſurrounding cellular ſubſtance is ſo dull and obtuſe in its ſenſations, that though it is the ſeat of a peculiar kind of ſenſibility, its diſeaſes make great progreſs with little pain, and though ſtricture in the urethra and abſceſs of the perinæum are diſeaſes of no ſlight importance, yet the fact is, that they ſteal upon the patient by ſuch ſlow and inſenſible degrees, that he is hardly aware either that he is labouring under the one diſeaſe, or in danger of the other, before he falls into the moſt calamitous circumſtances. He is indeed ſenſible of the irritation and frequent deſire to paſs urine, but that ſeems not very particular, and at times he can retain his urine for hours. He obſerves the ſtream of urine diminiſhing in ſize, he ſtrains in diſcharging it, he remarks alſo a degree of running from the urethra; but theſe ſigns he aſcribes to ſome former gonnorrhæa, or the imprudent uſe of injections, and hopes they will diſappear. When at laſt the perinæum inflames, and a thickening and hardneſs appears in the courſe of the urethra, he is ſtill willing to aſcribe this to riding, leaping, ſome violent exerciſe, or ſlighter injury, or exceſs in drinking. The perinæum becomes highly inflamed, pain ſucceeds to irritation, the urine is well nigh obſtructed altogether, and the diſeaſe is verging faſt to its moſt dangerous ſtage, before it is diſcloſed to the ſurgeon. It is the reſiſtance at the ſtrictured part of the urethra, that cauſes all this diſorder in the parts nearer the bladder: could the ſtricture be inſtantly relieved, the in-

flammation in the perinæum might ceaſe, and often in this ſtage there reſults from the application of the cauſtic the very happieſt effects. But unfortunately the patient conceals his complaint from a miſtaken delicacy, or he is in the military ſervice, and has no good ſurgeon at hand. He is in ſome of the colonies abroad, and is induced to wait till his concerns are wound up, that he may come to Europe with peace of mind to regain his health, or he is long detained at ſea without a poſſibility of receiving help, and there he falls into the melancholy condition which I am next to deſcribe.

There is not in this caſe, as in rupture of the urethra, from a blow or fall, any ſudden effuſion of urine into the cellular ſubſtance. The urine is indeed never diffuſed among the cellular ſubſtance, elſe the phœnomena would be entirely different from thoſe of fiſtula. The cellular ſubſtance of the urethra is firſt condenſed by inflammation, its cells obliterated, and its ſubſtance altogether hardened, ſo as to prevent the urine ſpreading abroad; next, the part inflames, abſceſs forms, and then the urine is admitted into the cavity of the abſceſs; and when, at laſt the abſceſs burſts, urine and matter iſſue from the ſame opening. Nor is it all at once, by one abſceſs and one opening, that all this hardening and fiſtulous ſtate of the perinæum is produced: When firſt an abſceſs forms and burſts, almoſt the whole of the urine flows through the opening, but in proportion as this firſt fiſtula cloſes and tends to heal, the reſiſtances are ſo balanced that one half of the urine paſſes by the fiſtula, while the other paſſes by the natural canal; but in proceſs of time the firſt abſceſs heals and tends to cloſe altogether, ſo that little of the urine flows that way, almoſt the whole is diſcharged by the penis, but with ſo much difficulty, that the preſſure upon the diſeaſed parts in the perinæum is renewed, new abſceſſes form, new openings and new fiſtulas are produced, and thus, by a ſucceſſion of inflammations and ſuppurations, the parts are ſo indurated and maſſed together, that the whole of the perinæum reſembles a ſcrophulous ſore; the parts covering the canal of the urethra are knotted and maſſed together, like the integuments ſurrounding a carious or necroſing bone, and urine, and fœtid matter, and flatus, when the fiſtula penetrates to the rectum, are diſcharged through the various openings.

Nor is it one ſtricture that produces this complication of diſeaſe, for uſually there are two or more, and while one is ſurrounded with knotty calloſities, felt through the ſcrotum in the middle of the penis, another, more formidable, with its fiſtulous openings leading towards it, is felt in the perinæum.

The cellular ſubſtance of the urethra, whence this calloſity firſt takes its origin, is different from that of other parts; and the knottineſs of it, when thus diſeaſed, is not to be conceived. That callous knot which ſurrounds a ſimple ſtricture, is firm as a pea, and preſſing with your finger and thumb you feel it like a foreign body: when fiſtula is firſt threatened in the perinæum, you may feel the calloſity firm, knobby, and perfectly moveable, and you can move the urethra ſideways, with the finger and thumb, as if the bulb were injected with wax; the preſſure of your thumb ſqueezes out matter, which paſſes into the canal of the urethra, and iſſues from the penis; and ſuch a tumor I have ſeen for many alternate days, almoſt vaniſh, then return again, and at laſt diſappear, whence I am inclined to conclude that ſuch a ſmall abſceſs or blind fiſtula, opening not outwardly, but only into the urethra, varies in ſize according to the quantity of matter contained in it, and ſometimes is cured and obliterated. But when fiſtula occupies that part of the urethra which lies within the ſcrotum, you will generally feel the calloſity inſulated and knobby like a lump of molten lead; I know nothing in the human body it ſo much reſembles as the knot of callus ſurrounding an ill-ſet bone.

I have often, in examining ſuch indurations carefully, and in the daily practice of paſſing the catheter, remarked that upon preſſing particular knobs of the tumor, with the edge of the thumb and ſqueezing them, hard matter was ſpued out from the urethra in great profuſion; I have alſo remarked that ſuch indurations diſtort the canal, for although the ſtricture or other obſtruction be entirely removed, the catheter or bougie paſſes ſuch a part with great difficulty.

From the time that urine begins to iſſue through openings in the perinæum, the diſorder becomes every moment more complicated, and the condition of the patient more loathſome. When the urethra is obſtructed anew, and the perinæum inflames, when either the old fiſtulas are about to burſt out, or new ones are forming, the patient has diſtinct rigours and fever, and clouds do not more certainly portend a ſtorm, than rigour and a feveriſh paroxyſm, the generation of ſome new fiſtula. It is not a ſlight rigour that the patient is aſſailed with, but a cold fit like that of a quartan: the patient feels a ſickiſhneſs, languor, and giddineſs; his face grows pale, and the circle round his eyes livid; and when the fit comes on the bed ſkakes under him, with the violence of the rigour, and his teeth chatter audibly. He vomits a profuſion of bile; his urine is ſparing and high coloured; his temples throb, and the hot ſtage which ſucceeds is very violent, and is followed by a ſweating ſtage, very long and exhauſting. He is bathed in

ſweat, ſhirt after ſhirt is changed, and is actually wrung out before it is thrown into the cloſet. The bed cloths are thoroughly ſoaked. The fætor of the urine paſſing through the fiſtulous ſores and wetting the linnens, and the extreme frequency of paſſing water, and the imperfect manner in which it paſſes, the patient having hardly any degree of retenſion, makes his condition moſt miſerable. His frequent riſing to take the water-pot during the night, while under this ſweating ſtage, gives him cold and aggravates every ſymptom. The patient, after each paroxyſm, looks wan and meagre; he could not in the ſpace of ſeveral weeks entirely recover from the ſhock, but weeks are not allowed him, for one paroxyſm ſucceeds another at intervals of but a few days, bilious vomiting or diarrhæa often occupy the intermediate time, and the ſurgeon, with all his care to preſerve his patient from fever, is hardly able to find two days free from fever, during which he may perform his operations. This is an intermitting fever ſo purely ſymptomatic, that bark or wine, or antimonial medicines, are of little uſe; the patient very generally cannot uſe laudanum which only increaſes his ſickneſs; nothing can give relief but deſtroying the ſtricture and opening the fiſtulas.

The catheter, if it can be paſſed or retained at ſuch a time, is of uſe, by preventing the impreſſion of the urine upon the parts; and extreme cleanlineſs, air, and exerciſe in a carriage, and the warm bath, with opiate glyſters, palliate the diſtreſs till a fit time comes for attempting the cure.

When a patient commits himſelf to your care look well to his condition, reflect maturely on every circumſtance of his caſe, and weigh all the probabilities before you promiſe or ſeem to promiſe a cure; although he has been long labouring under diſeaſe, and the parts are in great diſorder, though the perinæum be perforated with irregular openings, and abſceſſes extend from the urethra to the ſcrotum and hip, you will not deſpair; becauſe, theſe points are acceſſible. But when the cellular ſubſtance of the pelvis is deeply affected, when flatus burſts through the ſeveral openings, demonſtrating that they penetrate to the rectum, though you will never abandon the perſon who puts his confidence in you, you will be cautious how you expreſs your hopes of ſaving him, to his friends.

This is ſo entirely a ſurgical diſeaſe, and the parts are ſo irregularly affected, that natural ingenuity and a ſpirit of enterprize are of infinite uſe, and a nice and careful hand in adapting inſtruments to the condition of the parts, and laying dreſſings ſo as to keep the ſores dry and clean, ſometimes performs wonders. The ſurgeon ſits down to reflect deliberately on the cauſes of the fiſtulas, and of their various

directions and communications, he paſſes firſt the catheter or bougie into the urethra, to feel for the obſtruction, he probes each fiſtulous opening, to diſcover its depth and direction, and its communication with other openings, and to obſerve whether the probe, when paſſed through the fiſtulous openings, and the catheter where it is ſtopped in the urethra, can be made to meet.

He examines carefully into all the circumſtances of his patient's caſe, that he may know in what ſucceſſion the ſeveral openings burſt out, and in what degree the parts have ſuffered. He then tries to get the ſtaff, if poſſible, into the bladder, introducing his finger at the ſame time into the anus, that he may be aſſured whether there is any diſeaſe within the pelvis, and beyond the reach of his knife. On the clearneſs of his conceptions and reaſoning, does the fate of his patient entirely depend; the ſtricture is to be relieved, the fiſtulas laid open, the canal made direct and clear, and the inciſions healed by eſcharotic applications: and, while no diſeaſed part is to be ſpared, nor part, either of the urinary canal or ſurrounding integuments is to be wantonly deſtroyed. In ſhort, care and cleanlineſs, ingenuity and induſtry, a perfect knowledge of the anatomy of the parts, and a mechanical genius for contriving various means of reſtoring the paſſage of the urine, and healing the openings, are of ineſtimable value; they are talents which may be improved and cultivated, and will eventually ſave the lives of patients, who, if laid in a foul bed and macerated in clods of relaxing poultices, would die.

Fortunately there is no doubt nor delicacy concerning theſe operations on the perinæum, which ſeems ſo cruel, and which are indeed ſo often unſucceſsful; the natural force of the urine never could overcome a ſtricture in the urethra, and the perinæum being perforated even that ineffectual force is taken off, the parts are running every moment into greater diſorder; the moſt vigorous health (and that is not to be expected) can never cure thoſe ſores, while the obſtruction in the urethra remains; the ſuppurations are continually ſpreading, and the fever increaſing, ſo that ſomething muſt be done, and ſince that part of the urethra which lies betwixt the ſtricture and the point of the penis is now of no uſe, we may proceed to remove the ſtricture, and ſince the urine has a free iſſue by the perinæum, we are not interrupted in our work.

Theſe general theories of the diſeaſe and of its cure, are of uſe to give the ſurgeon clear conception of the difficulties he has to encounter; but that he may learn how to encounter them, I ſhall proceed to lay down rules for his conduct,

in ſomewhat of an aphoriſtical form.—1ſt, It is not here as in the caſe formerly deſcribed, (viz. a ſudden burſting of the urethra,) the firſt duty of the ſurgeon to make free openings in the perinæum; for the walls of a fiſtula are ſo condenſed by inflammation, that the urine is not injected into the cellular ſubſtance, but flows through one or many openings, whoſe walls are firm and tube-like, as the name fiſtula implies. The firſt care then of the ſurgeon, in every caſe of fiſtula, whether old or recent, is to clear the canal, and that is beſt done by paſſing a cauſtic bougie down the urethra. If there be plainly a ſtricture in the urethra, if the bulb or lower parts are juſt beginning to give way, and the perinæum to inflame, let the cauſtic be applied ſtraightway; or let the common bougie be forced into the ſtricture, to procure a momentary relief, by freeing the paſſage and relieving the perinæum from its immediate preſſure; while leeches and ſaturnine ſolutions are applied to the perinæum, and the part ſupported with gentle preſſure. Sometimes in proportion as the paſſage is cleared by the cauſtic, the pain and ſwelling of the perinæum ſubſide, and the patient is ſaved from a breach in the urethra.

2d, When the diſeaſe has proceeded a point farther, and there is not only an inflammation in the perinæum, and a threatening of danger, but an actual abſceſs; the ſurgeon ſhould make no delay, but open it: there is indeed no danger of the urine being diffuſed widely under the ſkin, but there is danger of the abſceſs extending itſelf, of more cellular ſubſtance being deſtroyed by ſuppuration, and of the urine being admitted into a larger ſac; in ſhort, the abſceſs in perinæo will always be more or leſs extenſive, in proportion as it is more or leſs prudently managed; and it is a point of prudence to open it early. If it could be prevented from ſuppurating, that would be a great point; but, when it has already ſuppurated, and points to a head, when you diſtinctly feel the matter, and ſuſpect, from circumſtances, that the urine has acceſs to the abſceſs, you open it without loſs of time, with the point of a lancet; and let no ſcoundrelly motive of prudence prevent you doing your duty, for there is no doubt that the opening will be difficult to heal, and there is more than a probability that you will ſuffer blame; but while the ſurgeon is opening the abſceſs, let him, at the ſame time, take every meaſure for freeing the natural paſſage.

3dly, In caſes of irregular and complicated fiſtula which has continued long, when little urine paſſes by the urethra, and much through fiſtulous openings, become callous by time; where there is no threatened diſeaſe, which may be prevented by timely inciſions; where either the ſurgeon feels plainly one long and

formidable ſtricture, or ſuſpects various obſtructions in diſtinct parts of the canal, he will give firſt his whole attention to the clearing of the natural paſſage, that he may afterwards deal more ſucceſsfully with the fiſtulas.

His means of overcoming ſuch ſtrictures, muſt be adapted to the circumſtances of each. If he has reaſon to believe that there is but one ſmall and ſolitary ſtricture, he will perhaps hope to give a temporary relief, by forcing the point of a bougie into it, and thus, for a moment, taking off the force from the perinæum, he may gain time for the uſe of the cauſtic, and be able in a more deliberate way, to deſtroy the ſtricture altogether, and reſtore the free ſtream of urine. If, from the hiſtory of the complaints, and a diſtinct account of what has been done by former ſurgeons, if from the entire obſtruction of the urine, from the extenſive fiſtulas and long continued diſeaſe in the perinæum, he has reaſon to believe that the ſtricture is very compleat; but eſpecially if upon feeling the urethra, he is ſenſible that the obſtruction ariſes, not from a ſingle ſtricture, hard and round like a pea, at one point of the urethra, but from ſeveral contiguous ſtrictures occupying a conſiderable length of the urethra; if, to ſpeak more accurately, he feels with the finger and thumb, a ſpace of the urethra, nearly half an inch in length, ſmall and hard, like a big thread, at which the bougie or catheter ſtops, he has reaſon to fear, that not a hundred applications of cauſtic would deſtroy ſuch a ſtricture, and is ſenſible that he muſt have recourſe to rougher methods. He introduces the ſtalk of a ſilver catheter, the bend being cut ſmoothly off, and uſing it as a canula, he plants the point of it upon the ſtricture, and paſſing down a trocar or piercer, either ſquared or lancet-pointed, and graſping the urethra firm in his left hand, and holding the piercer firmly with his right, he bores it along, (a thing which cannot be done without much force and exquiſite pain to the patient) and makes his way through the ſtricture, indifferent whether it paſſes through the body of the ſtricture or by the ſide of it, if only it meet the open part of the urethra. This operation I hold to be chiefly practicable in ſtrictures manifeſtly of conſiderable length, and occupying the middle parts of the urethra, eſpecially that which lies within the ſcrotum; and I have found the operation greatly facilitated, by feeling very carefully from the point where the catheter ſtops, ſo as to aſcertain the extent of the ſtricture, making the patient in the meanwhile preſs his urine, ſo that I would feel the urethra dilated into a ſort of ſac, behind the ſtricture. This ſound and dilated part of the urethra is that which is to be aimed at with the trocar: I have found it neceſſary to hold the urethra and penis par-

ticularly firm, for it requires great force to drive the piercer on: and in this operation of working the urethra along the piercer, as you would put the bait on a fiſhing-hook, I have, I confeſs, found the greateſt difficulty in hitting preciſely the free and dilated part of the urethra behind the obſtruction. The lancet-pointed trocar is, I am certain, from experience, preferable to the round or ſquare-pointed trocar, and I think it neceſſary to mention, that generally and almoſt neceſſarily, the trocar muſt enter the ſide of the ſound part of the urethra, whence there will be a degree of crookedneſs in the new canal; and if there be any collateral abſceſs to diſtort the urethra, the irregularity will be very great, and the catheter will paſs this point with a degree of difficulty, and not without ſome addreſs on the part of the ſurgeon, who muſt learn, by practice, towards which ſide the obliquity lies. To prevent or leſſen this, to preſerve as far as poſſible, a direct channel, a large leaden probe as big as the catheter ſhould be worn during the cure, and the cauſtic occaſionally uſed: this operation of perforating is, I acknowledge, difficult and delicate, but we ſpeak now of caſes where bougies are merely a torment, and the cauſtic ineffectual.

This ſtricture in the middle of the penis, is uſually accompanied with ſtrictures equally formidable near the bulb, the immediate cauſe of the fiſtula. Theſe are to be cut with the knife, rather than cauteriſed, for the fiſtulas of the perinæum lead directly to thoſe lower ſtrictures, the probe or directory paſſed to the bottom of the fiſtula, touches this point; and when the fiſtula is to be laid open, though it would be wrong where there were no breach, to approach the urethra, it is good practice, when there is an opening in the urethra, and that callous, to make that opening a part of the inciſion; to paſs the ſtaff down till it is ſtopped by this lower ſtricture; to paſs the directory along the fiſtula, till it almoſt touch the ſtaff; to obſerve well the direction of each, and to cut along the directory till the ſtaff is laid bare.

4th, To attempt any ſurgical operation on the perinæum, before the free courſe of the urine is reſtored, would be but loſs of labour, and a wanton deſtruction of parts; and the moment that the canal is free, the urine, no longer diſordering the parts, they ſhew a tendency to heal, while the bladder itſelf ſeems to recover its powers. I have ſeen a patient, whoſe incontinence of urine was ſuch as to wet the bed inceſſantly, and lead me to ſuſpect that the body of the bladder itſelf was perforated, ſo relieved, by cauteriſing or perforating the ſtricture, that he has retained his urine from night to morning, and from morning till night, paſſing

two pounds at once. When the operation of the cauſtic is compleat, the ſtricture perforated, or the free courſe of the urine, by any art reſtored, the ſurgeon addreſſes himſelf to the new and arduous duty of healing the ſores, he performs now on the fiſtula in perinæo, the ſame radical operation that he would on the fiſtula in ano, i. e. he lays it completely open. He places the patient as for the operation of lithotomy; examines all the openings once more with the probe, and ſounds their depth, and remarks their relation to the urethra. He then introduces the ſtaff down to the ſtricture in the perinæum, and gives it to an aſſiſtant to hold; he next paſſes the grooved directory, perhaps a little bent, along the main channel of the fiſtula, till it reach the ſtricture, and almoſt touch the ſtaff; he then either runs his ſharp or probe-pointed biſtory, as he thinks beſt, along the directory, or he cuts with a common ſcalpell, till he at once lays open the fiſtula and cuts the ſtricture, making it the laſt part of the inciſion and nicking it fairly. He has now laid ſome length of the ſtaff naked, but, to be aſſured that the ſtricture is completely undone, he puſhes the point of the ſtaff through the inciſion of the perinæum and then paſſes it into the bladder. He then withdraws the ſtaff, and introducing the flexible catheter, or a leaden ſtaff, dreſſes up the inciſions lightly, and perhaps orders a warm ſtimulant fomentation of chamomile decoction ſharpened with ſal ammoniac to be laid over the parts and repeated from day to day to keep them clean and in a pleaſant ſtate; and, though the circumſtances of the caſe ſhould have forced him to lay open a conſiderable length of the ſtaff, he need not be diſmayed, for we frequently ſee ſeveral inches of the urethra (I have ſeen full three inches of it) regenerated, or rather replaced, from the growth of the ſurrounding parts.

In the future dreſſing, though I do not altogether forbid the occaſional uſe of poultices, I do not approve of their being continually applied, the warm bath or ſtimulant fomentations are much to be preferred, while the parts will always be found moſt healthy when kept dry and clean. The ſponge and lint are the beſt dreſſings. The callous parts may be touched with cauſtic; and when the granulating proceſs languiſhes the parts may be animated with red precipitate mixed with baſilicon; ſpirits of turpentine, when not applied too widely ſo as to parch the parts, but touched on with a hair pencil, is often remarkably uſeful; and, the alternating theſe ſtimulant applications with poultices, is particularly uſeful, for the occaſional uſe of a poultice which, if continued, relaxes and indiſpoſes the parts, ſwells them, increaſes their ſenſibility, and expoſes them to the operation of the

turpentine or precipitate. Never let ſuch ſores be crammed even with lint, far leſs with ſtimulant dreſſings, but let the dreſſings be laid on lightly and retained with a (T) bandage. The flexible catheter, if it can be retained, promotes the cure greatly by ſaving the parts from the excoriation of the urine; but it is not to be imagined that the lodging of the catheter within the bladder prevents altogether the urine tainting the parts, for every time the bladder acts (and it acts more frequently and more irreſiſtably when ſtimulated by the catheter) the canal of the urethra dilates ſo, that while much of the urine flows through the catheter, ſome paſſes by the ſide of it and iſſues at the perinæum.

The bathing the parts with ſalt-water contributes to prevent the itching and preſerves them cleanly and granulating, and the uſe of ſea-bathing and exerciſe often contributes to the final cure of ſores which ſeem altogether callous; but it is not to be concealed that often, after the cure of the great fiſtula, and when the perinæum ſeems entirely reſtored to a healthy ſtate and the urethra to be free of obſtruction, one ſmall point continues perverſely open, and can by no means be healed; and the circumſtance of the patient being now reſtored from the moſt melancholy to a comfortable ſituation diſcourages the ſurgeon from making any new attempt.

Definite as theſe rules may ſeem, and ſimple in their application, I ſhould feel that I had executed my duty very imperfectly if I did not enable my reader to aſſociate ſtill more correct ideas with theſe rules, and enable him to apply them with confidence in any given caſe; and this is I apprehend very eaſily done by repreſenting an actual caſe in the form of a plan; and my reader is to underſtand that, in laying ſuch a plan of the diſeaſed parts before him, both in a full view and in profile, my purpoſe is, to enable him to follow me in my reaſonings upon the way in which the ſeveral parts were affected in an individual caſe; I repreſent to him the conjectures I formed in feeling the parts with the finger and thumb aſſiſted by the ſtaff and probe; in ſhort, I preſent to him ſuch a plan of the parts as I ſhould naturally draw for my own private uſe before operating.

In theſe two plans, figures 1ſt and 2d of a complicated ſtricture and fiſtula in perinæo, I repreſent as I have actually felt; 1ſt, A ſtricture about three inches down the urethra; behind that ſtricture a thickening and knotting (a a) of the cellular ſubſtance ſurrounding that part of the urethra which lies within the ſcrotum; nor is it merely a thickening but an abſceſs, from whence, upon ſqueezing particular knobs with the thumb, matter iſſues through the penis. 2dly, A dilated

part behind the firſt ſtricture, which, when the urine advances to the ſtricture and is ſtopped by it, is ſo dilated by the force of the bladder as to be diſtinctly felt through the ſcrotum. 3dy, A ſecond ſtricture in that part of the urethra which lies in the perinæum; but this, in place of having formed an abſceſs opening merely into the urethra, has formed various fiſtulas through which the urine flows by the perinæum; one main fiſtula (b) opens into the perinæum; while another (c) has extended much farther, has made a great abſceſs in the hip, and opens on the point of the hip near the anus.

The patient preſenting himſelf in this ruined condition, the firſt meaſure I take is to open the abſces (c) in the apex of the hip, in order to prevent the farther deſtruction of parts; ſecondly to introduce a trocar by the penis and pierce the firſt ſtricture (1), which is diſtinctly felt to be much too long and too firm to be effected in the courſe of many weeks by a cauſtic; the trocar and canula are puſhed forward till they meet the dilated, but ſound part, of the urethra, marked (2); thirdly, the catheter being paſſed down to the lower ſtricture and the directory puſhed into the fiſtula in the perinæum, the fiſtula is opened by running in a biſtory along the directory, and the ſtricture is included in the inciſion. The catheter is thus laid bare, and then paſſed into the bladder. The lower drawing, or figure 2d, repreſents the diſeaſed parts as they would appear if cut out from the pelvis and laid on a diſſecting board. The ſtrictures and abſceſs are marked with letters or figures correſponding with thoſe of Figure 1ſt; and I would fain believe that it is almoſt ſuperfluous to explain that (d d) marks the corpora cavernoſa penis, at the place of their union. (e) The membraneous part of the urethra below the loweſt ſtricture. (f) The proſtate gland. (gg) The veſiculæ-ſeminales; and (i) the body of the bladder.

The flexible catheter made of elaſtic gum is infinitely preferable to any other; for, after a little while, it ſoftens with the heat and becomes as limber as the natural canal.

OF TOTAL OBSTRUCTION OF URINE AND THE OPERATION OF PARACENTESIS VESICÆ.

I ſhall cloſe this volume with the deſcription of a deſperate operation, which is yet our ſole reſource in the laſt ſtage of miſery. The operation of paracenteſis is

Plans of Fistulu & of Enlarged Prostule.

facing Page 254.

Plan 1 of discused Prostule. vide page 275.

Fig. 1.

Plan of Complicated Stricture and fistula.

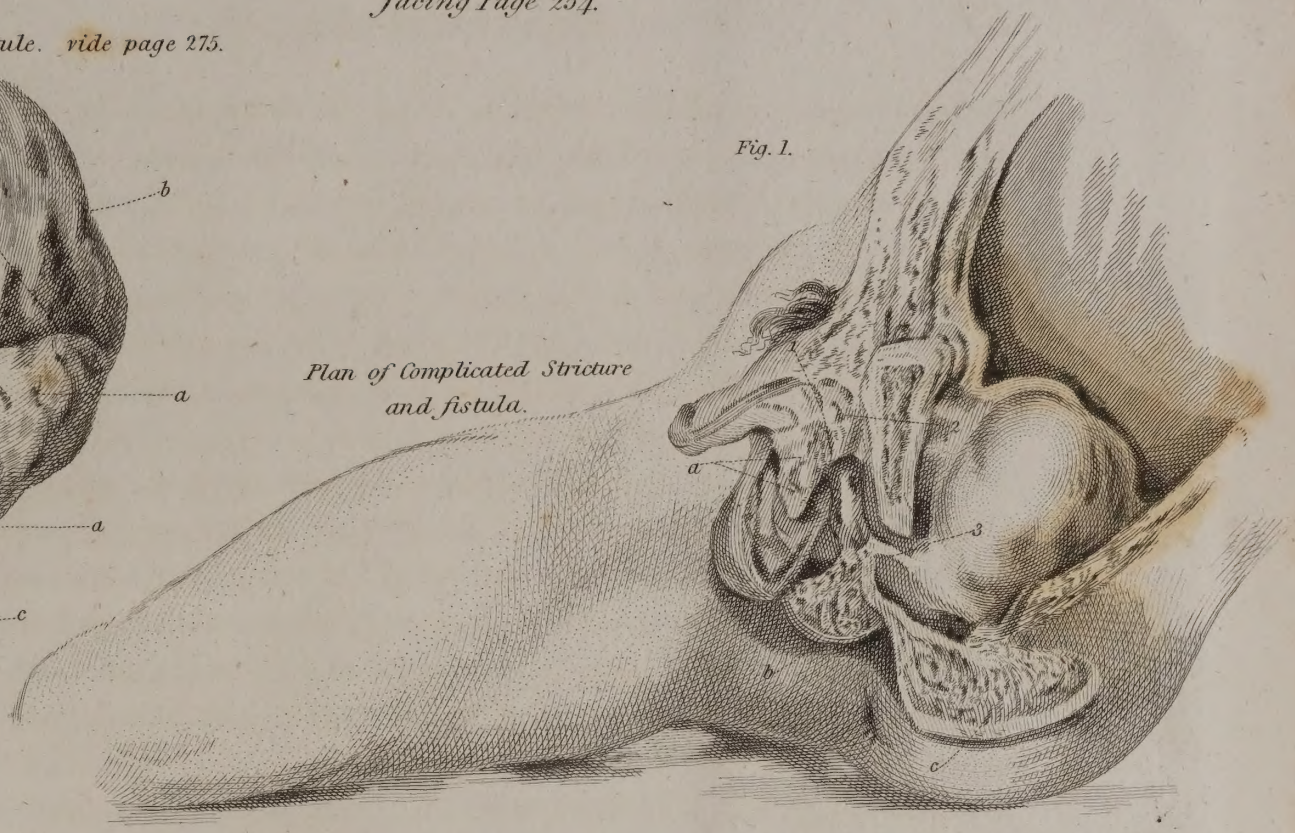
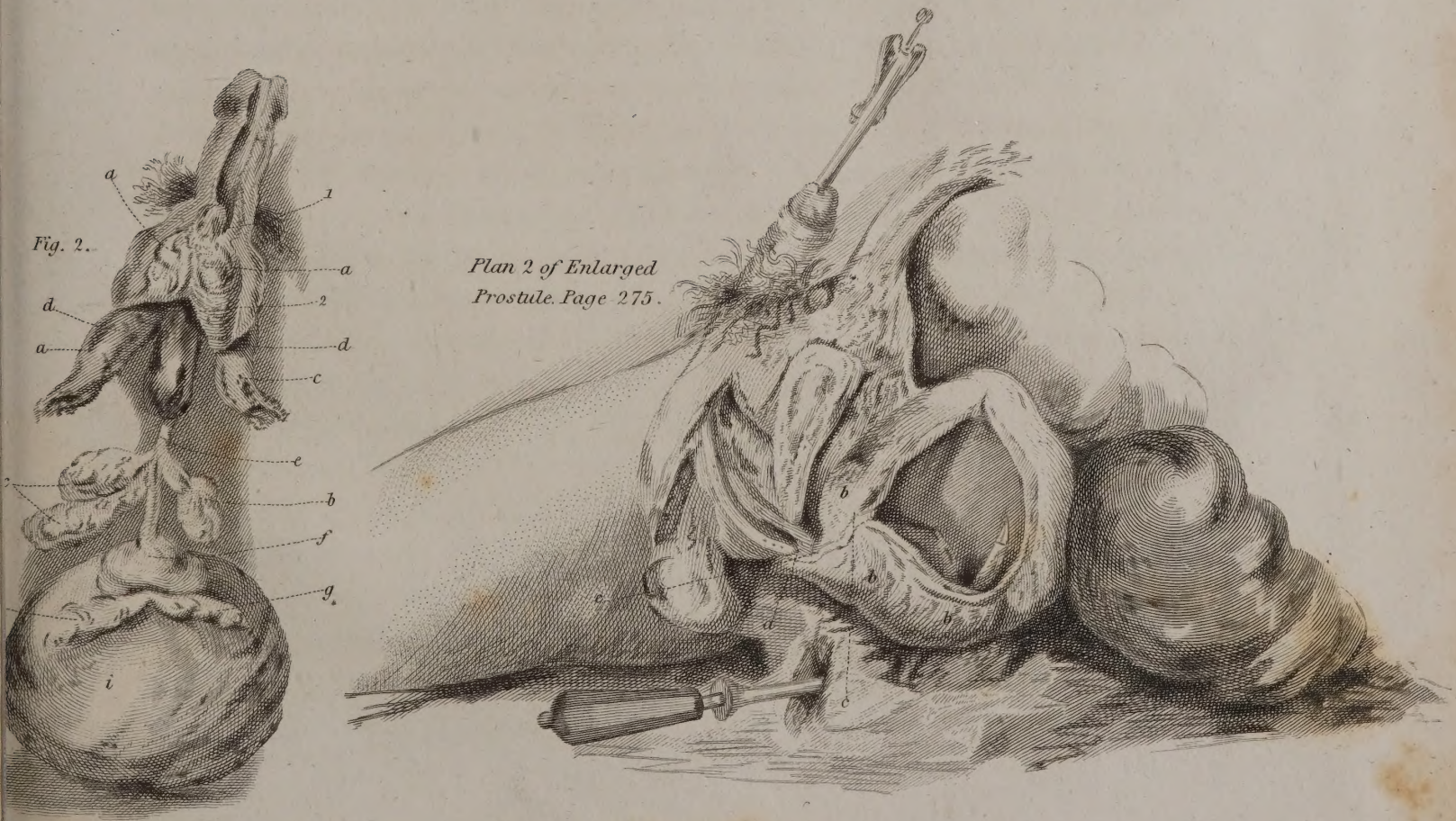


Fig. 2.

Plan 2 of Enlarged Prostule. Page 275.



Drawn by I. Bell. *Published for Longman & Rees & Cadell & Davies, June 16th 1804.* *Engraved by E. Mitchell.*

leſs frequently reſorted to as the means of ſaving the lives of young and imprudent people, it is more commonly reſorted to as a means of prolonging the years of the aged and infirm. When in a young and otherwiſe healthy man it happens that, by a blow or fall, the perinæum is injured; or when, from a neglected ſtricture and a ſudden ſuppreſſion of urine with fever, it is neceſſary to perform the operation of paracenteſis veſicæ, the ſcene is very diſtreſſing; but when in a man far advanced in years the proſtate gland has been long diſeaſed and has occaſioned frequent obſtruction; when, at laſt, the bougie gives no relief and the catheter cannot, even with any degree of force or rudeneſs be driven into the bladder, the ſcene is not leſs affecting, for this ſwelling of the proſtate is a diſeaſe almoſt peculiar to learned and ſedentary men; and the patient's age, infirmities, and preſent ſufferings; the dignity with which he ſupports them; the preſence of his family depending perhaps on the ſurvivancy of his offices, and the melancholy diſperſion of his family, which muſt follow his death, create a ſtrong ſympathy. His genius and literary talents give us a particular intereſt in his fate; the operation is, it muſt be acknowledged, but a temporary reſource, yet ſuch a man can bear to linger on a little longer, and, with his family around him, think it happineſs.

It is not poſſible to refrain from alluding to a melancholy ſcene which returns too often not to leave ſerious impreſſions, and it is moſt natural to feel ſome degree of anxiety in trying to reſolve many doubts concerning the proper conduct of the ſurgeon in circumſtances naturally perplexing; where the chief maſters in ſurgery deny us the benefit of their advice and counſel, "I muſt own," ſays one of the firſt ſurgeons of our own country, "that I have not ſeen caſes enough to enable me to give all the varieties that occaſionally happen, and, of courſe, all the advantages and diſadvantages of each method *." But are thoſe who preſume to teach entitled thus to decline giving their beſt advice becauſe every ſuch caſe is full of difficulty and danger? Is it fair thus to devolve the moſt difficult queſtions in our art upon the individual ſurgeon perplexed at once by the delicacy of his ſituation and the ſelfiſh reſerve of authors, whoſe province it is to lay down the plain line of his duty? Whatever preſumption there may appear in offering to explain a ſubject which has been declined by ſo great a maſter in ſurgery as Hunter, I cannot but reflect that this is an operation which may eventually fall to the lot of every ſurgeon to perform; that nothing could be more ungracious on the part of a teacher than to devolve on every young man the difficult taſk of

* Laſſus uſes very literally the ſame expreſſions: "Cette operation ſe faiſante trés rarement, on n'a point ſur ſes avantages, et ſur ſes inconvenients, toute l'experience qu'il ſeroit a deſirer, &c." Lassus, p. 292.

going unaſſiſted through a long proceſs of reaſoning upon the choice of inſtruments or methods, attended with the imminent riſk of thinking too long, or of acting too raſhly: I cannot but recollect that the young ſurgeon coming unprepared to ſuch an operation may make his inciſions in the perinæum deep and wide and yet miſs the bladder, and find no better way of retrieving his error than by performing a ſecond operation by inciſion above the pubis: I have ſeen this, and, to my utter amazement, have ſeen a patient ſo mangled ſurvive.

That a patient ſhould recover who had ſuffered two of the moſt cruel and dangerous of the many operations which have been invented for relieving the diſtended bladder, is a fact which ſets all argument at nought, and is enough to diſcourage us from truſting to reaſoning of any kind. Yet if there be in all ſurgery an operation in regard to which we may allow ourſelves to be guided by principle, it is in this. The experience of the individual may be limited, but the experience of ages is a free and precious ſource of inſtruction. Let the ſurgeon then who preſumes to write on the general ſcience, give, as if he were conſulting on an individual caſe, his beſt and moſt impartial counſel, and where the reſources of his own experience fail, let him collect the ſenſe of former authors.

Though allied with lithotomy, or rather ariſing from it, this operation of paracenteſis is infinitely more difficult to perform; for, while lithotomy has in various ages been performed in various ways, always the inciſions have been guided by a ſtaff, but in puncturing the urinary bladder where no catheter can be introduced, the ſurgeon has no guide but his knowledge of the parts. He does not conduct his inſtrument along the groove of a ſtaff; if he diſſects for the neck of the bladder, he muſt in performing ſuch diſſection, truſt to his knowledge of the parts; if he merely ſtrike the trocar into the bladder, without previous inciſion, ſtill he truſts to his ſkill in anatomy.

The many doubts and fears that muſt come over the mind of the ſurgeon in preparing to perform ſo eventful an operation are only to be divined by reflecting on what has gone before, as well as on the circumſtances of preſent difficulty: many days have already elapſed ſince the patient was in pain and his friends aware of his danger; they are conſcious that his critical ſituation is one in which an inventive head and dextrous hand ſhould be able to do a great deal, and they look up to the ſurgeon at firſt with hope and confidence. But frequent attempts are made to paſs the inſtrument, every renewed attempt promiſes relief, and each diſappointment leſſens the confidence of the relations and of the patient in the operator, or in his art.

Theſe friends are ill prepared, at ſuch a time, to receive the intimation that more deſperate meaſures muſt be reſorted to, and the ſurgeon loſes their confidence in the very time when he needs every ſupport, when he is to undertake a difficult operation, perhaps by candle-light, with few aſſiſtants, and is obliged to perform it in haſte and trepidation, after the fatal ſymptoms of abdominal inflammation are begun! often, as in caſes of hernia, it comes too late to ſave the patient's life.

The ſurgeon, who has to perform in difficult circumſtances, a very eventful operation, who has to ſilence his own doubts and fears, to conciliate the friends, and to confirm his patient in every good reſolution, ſhould not be left unſupported by fixed and ſteady rules of conduct, if ſuch can at all be deduced from experience or from reaſoning on the ſtructure of the parts, he ſhould be taught to reſolve without delay, and to operate without fear. But while the ſurgeon is unaſſiſted by the experience of his elder brethren, he is not inſtructed by the hiſtory of the ſcience, nor taught to make an impartial and juſt ſelection of the methods or inſtruments he ſhould prefer; ſo entirely is hiſtory neglected, that I know not where the ſurgeon could find (independent of any marks of approbation or diſapprobation), even a bare and naked catalogue of the various projects for puncturing the bladder. Surely where there have been ſo many inventions there muſt be many difficulties, there muſt be much delicacy in the election of any one method, but it unfortunately happens that modern authors are ſilent concerning every method but the worſt, and that alone is deſcribed. Is it not melancholy to obſerve, that for the ſimple purpoſe of tapping the urinary bladder, inciſions are performed equal in extent, and exceeding in danger, thoſe practiſed for the extraction of the ſtone? It was very natural for each lithotomiſt to adopt a method of puncturing the bladder correſponding, in ſome reſpects, with that which he uſed in cutting for the ſtone; but that of all the various methods one only ſhould be remembered! that the trocar ſhould be entirely diſuſed, and the very meaning of the word paracenteſis veſicæ, or tapping the bladder, be utterly forgotten! that whether in making the opening from the perinæum or from above the pubis, deep inciſions ſhould be ſubſtituted to the mere puncture, or made at leaſt the firſt ſtep towards operating with the trocar, is indeed ſurpriſing.

In the ſurgical ſyſtems of the preſent day, this is the uſual prologue to the ſubject of paracenteſis: "The operation of paracenteſis veſicæ, is to be performed by an inciſion in perinæo, in the ſame manner as in cutting for the ſtone." I hope not: I hope and truſt that paracenteſis of the bladder will never again be performed

by the ſame inciſions as the lateral lithotomy: how the operation ſhould ever have aſſumed this formidable aſpect, is only to be underſtood from a certain epiſode in the hiſtory of lithotomy, which, I believe, I have not related, or not diſtinctly.

Two hundred years ago the operation of lithotomy had indeed become more familiar, but the diſeaſe was frequent, and the operators few in number. The itinerant lithotomiſts, who went from city to city, viſiting at fairs and in villages, to procure practice, were not proportioned in number to the diſtricts they occupied. They travelled far and wide, ſo that their infrequent return to particular diſtricts, together with the horror of the operation, and the timidity of the peaſantry and lower ranks of people, who could not at all times reſort to cities where penſioned lithotomiſts practiſed, was the occaſion of the ſtone being allowed to remain in the bladder, increaſing, in a courſe of years, to an enormous ſize. No ſtones are now to be ſeen comparable to thoſe preſerved in the old muſæums of Paris and Amſterdam; and the old ſurgeons, when they deſpaired of extracting a ſtone, knowing it to be too large, or when they found it ſo, after having made the uſual inciſions, refrained from introducing the forceps: made no violent attempts to extract the ſtone: but puſhed a large canula into the wound, wrapped round with lint or linen-rag, which canula by keeping the bladder continually empty, by preventing its contractions, and bearing up in ſome degree the weight of the ſtone, gave preſent eaſe to the patient, and preſerved him alive. So familiar did they become with this operation of the canula, that after introducing it, they laid a plate of ſteel over it, introduced a drill or auger, bored the ſtone and burſt it up with wedges; in ſhort they quarried thoſe ſtones which they found too big for extraction, and thus revolved once more, after a long ſucceſſion of ages, the practice of *Ammonius Lithotomus*, who, before the times of Hippocrates, was celebrated for his addreſs in breaking large ſtones. In caſes of diſeaſed bladders alſo, where there was no ſtone nor ſuſpicion of ſtone, the ſame inciſions were made, and the canula involved in linen rags, paſſed into the bladder: and after every operation for the ſtone, the canula was introduced to cleanſe the bladder, and allow the pus to flow off. The operation of the canula was, in ſhort, a favourite reſource in the times of Colot, and even with Le Cat, Morand, and Mareſchall *. This

* "M. Thevenin, chirurgien ordinaire du Roy et chirurgien juré à Paris nous apprend qu'il eſt des occaſions où il ne faut pas eſſayer de tirer la pierre de la veſſie, par exemple, lorſqu' on juge que la pierre eſt trop groſſe, ou que le malade eſt ſi vieux et ſi foible qu'il ne pourroit ſupporter l'effort de la taille, ni la violence des ſymptômes

coarſe and deſperate reſource of the oldeſt practitioners, in the worſt age of ſurgery, is, by a ſtrange fatality, copied into modern ſyſtems, as a moſt meritorious operation, and the deep inciſions and the canula, wrapped round with linen rags, are ſpecified with particular care. This mangling operation is repreſented as the work in which the ſurgeon muſt be engaged, whenever the catheter will not paſs: for this, the ſimple and dextrous operation of paſſing a trocar and canula into the bladder, is abandoned: This is what is called *puncture of the bladder!*

Of all literary men, thoſe of our profeſſion are leaſt in danger from that witty criticiſm of Stern, who ſays, that "Authors make books, as apothecaries make mixtures, by decanting from different glaſſes into one." Authors in our profeſſion are contented with their own ſole experience, and when they wiſh to appear learned, the laſt book, whether it be that of a Le Dran, a Sharp, or a Heiſter, ſerves to the new ſyſtem-maker, as an epitome of the whole ſcience, theory, and practice: ſurely the proceſs, not of compounding mixtures, but of decanting *ſimples* from hand to hand, has drained the ſcience to the very lees, when an author can ſay concerning *puncture of the perinæum*, "That it is to be performed after the manner of the lateral *lithotomy*," and of every other method, "That it is unworthy of notice, and that, without farther conſideration, it ought never to be employed."

The gradual progreſs of the ſcience cannot enrich our art nor be uſeful to ſociety, otherwiſe than by enabling us to compare the opinions of good ſurgeons of former times, with thoſe of the preſent day; and it is the firſt duty of a teacher

qui ſuivroient une inciſion auſſi grande que le demanderoit le volume de la pierre: mais ſi ce corps étranger tombant ſur le col de la veſſie la bouchoit et cauſoit tres-ſouvent un retention d'urine, ou ſeroit obligé de le repouſſer avec la ſonde pour permettre à cet excrément de s'echaper; et comme les frequentes entrées et ſorties de la ſonde, pourroient irriter le paſſage et y cauſer la gangrene, il propoſe l'opération qui ſuit. Il faut ſituer le malade de la maniere qu'on fait au grand appareil, puis introduire une ſonde canelée courbe dans la veſſie, et ſur la ſinuoſité de l'inſtrument ou fait une inciſion comme ſi ou vouloit tirer le pierre, excepté que la plaie doit être beaucoup plus petite. Incontinent après on fait entrer un ſtilet dans la veſſie, le gliſſant le long de la canclure de la ſonde; ce ſtilet ſert à y conduire une canule d'argent longue de quatres doigts, en le paſſant dans la cavité de la canule: on retire enſuite le ſtilet, et on attache la canule à une ceinture, par un ruban paſſé dans les deux anneaux qui ſont à ſa tête. On laiſſe continuellement dans la plaie cette canule, qui empêche la pierre de ſe preventer d'avantage au col de la veſſie et de flotter de çà et de là, ce qui fait vivre le malade avec moins de douleur juſqu' à ce que ſes forces ſoient rétablies pour ſoutenir la taille: mais quelquefois la canule lui ſera ſi peu incommode, qu'il aimera mieux la porter avec patience, que de s'expoſer à la taille, dont il pourroit mourir. Il faut que cette canule forme à vis pour retenir et vider l'urine quand on veut. On peut par le moyen de cette canule faire commodément des injections dans la veſſie pour beaucoup de maladies auxquelles elle eſt ſujette." Dionis, page 228.

to make an impartial and careful ſelection from among the various methods of operating; but in place of declaiming about the uſefulneſs of this taſk, I ſhall endeavour to perform it.—When we witneſs the death of a patient, whether from fever, from the mortification of ſtrangulated herniæ, or in conſequence of any great operation, we remark equally, in all theſe caſes, certain awful preſages of approaching diſſolution. The pale and ghaſtly viſage and ſunk features; the low and muttering delirium, quick and fluttering pulſe, hiccup, and ſlight convulſion are ſure preludes to approaching diſſolution; and it ſeems as if theſe were but the natural conſequences of the powers of life running low; as if death, from whatever cauſe, were neceſſarily preceded by the ſame ſigns. But after any great operation, in conſequence of which the abdomen is apt to be affected, the ſurgeon, (watching over his patient, with all that intereſt and ſolicitude which his own reputation and the fate perhaps of his friend muſt excite,) will remark a ſucceſſion of very peculiar ſymptoms, which eſtabliſh a cloſe analogy among all the caſes of abdominal inflammation.

When a woman is in labour, and that the hour of her delivery is protracted, many cauſes conſpire to produce inflammation of the abdomen: the abdomen has been diſtended to the utmoſt degree, by the growth of the womb; and the ſtate of the circulation among its viſcera remarkably changed; impatient of this excitement, the abdominal muſcles are at laſt rouſed to action, by a feeling reſembling teneſmus, and continue for ſeveral days to compreſs the womb, preſſing it gradually lower, impacting the head of the child into the pelvis, and diſtending the vagina. When labour is fairly begun, when the parts within the pelvis are at once dilated by the child's head, and bruiſed and compreſſed againſt the bones; when the urine is retained, and the bladder kept diſtended; when the pains of labour ceaſe and return alternately, the parts continuing thus for ſeveral days in a ſtate of diſtenſion and ſuffering, the abdomen at laſt inflames, the pains gradually grow weaker, and at laſt ceaſe altogether; the woman lies quite exhauſted, and faints when raiſed out of bed; ſhe falls into a low and muttering delirium, or, if rouſed to any exertion, (either by ſome ſlight return of the labour pains, or by the endeavours of the accoucheur to aſſiſt her with the lever,) ſhe utters only a faint and delirious ſcream; the face, before inflamed and turgid, with the force of the labour, becomes pale and livid, the abdomen ſwells, and is inſufferably painful to the touch; the pulſe is rapid, weak, and fluttering, the mouth parched, and the lips dry and black; the patient is dying of fever and inflamed abdomen, and if ſhe

can be at all ſaved, it muſt be by being immediately delivered with the lever or forceps.

We muſt acknowledge that many of theſe ſigns cannot be ſo properly aſcribed to inflamed abdomen, as to long continued labour and pain. But in every important ſurgical caſe requiring operation, there are pains and ſufferings equivalent to thoſe of protracted labour. I have watched the patient's ſtate in caſes of hernia, through every ſtage from the firſt moment of ſtrangulation to the hour in which the operation ſhould have been no longer delayed, and from that critical moment to death, through many hours of protracted ſuffering. I have ſeen many die unrelieved, or after operations performed too late, and have always found the analogy of hernia with protracted labour very ſtriking and inſtructive.—When firſt the hernia is ſtrangulated, the free courſe of the fæces is interrupted; the patient is ſickened and begins to vomit; his pulſe is low and weak, his extremities chilled, his countenance or voice are but little affected; but, on the third or fourth day of the ſtrangulation the pains of the abdomen become very acute; the pulſe becomes weak, indiſtinct, and extremely rapid; the lips become livid, the cheeks hollow, and the face ghaſtly; the voice is gone, the breathing is quick and interrupted with long drawn ſighs, a ſort of ſtupor comes over the patient, and except when rouſed and in the act of vomiting, he lies inſenſible; the belly ſwells, and becomes ſo exquiſitely ſenſible, that the ſlighteſt handling of it gives pain.

If a woman in travail is exhauſted by her labour pains, ſo is a patient in hernia, by a want of ſleep, inceſſant vomiting, pain, and fever, and eſpecially by the frequent efforts of the ſurgeon to reduce the inteſtine! the laſt moments of both are the ſame: the ſwelling of the belly, the ſunk countenance, the parched tongue, the frequent vomiting (for the vomiting of hernia continues after the ſtrangulation is relieved), indicate the inflammation of the abdomen; and in both caſes the ſame low delirium and indiſtinct and fluttering pulſe cloſe the ſcene; and as the woman in labour is excited to a delirious outcry, by every attempt to deliver her, ſo is the patient in a caſe of ſtrangulated hernia, rouſed from the inſenſibility to a delirious ſcream, even after the power of ſtruggling with the aſſiſtants is over; he is rouſed to this violence by every thing preparatory to the operation, from the firſt laying him upon the table, to the final act of reducing the inteſtine. In caſes of ſtrangulated inteſtine the affection of the abdomen is always moſt particularly marked, it is the chief danger, and our prognoſtic is to be deduced from the ſigns of this

inflamed ſtate. I have ſeen a woman expiring of femoral hernia, with a tumor ſo ſmall as to be hid in the cellular ſubſtance of the groin, and ſymptoms ſo purely thoſe of abdominal inflammation and exhauſted ſtrength, that were an accoucheur to approach ſuch a woman, impreſſed with the notion of her being in labour, he would find preciſely thoſe ſigns of danger which uſually in his practice, induce him to apply the forceps.

Even when the operation for hernia is performed in happy time, the inteſtine relieved, and the patient's life preſerved, ſhe ſtill is not out of danger: abdominal inflammation once excited, does not eaſily ſubſide: for three weeks the patient is ſwimming for life, with the ſame fever and the ſame torments, (proceeding from inflammation of the abdomen,) that are produced by bad wine, poiſon, or puerperal fever; the face is pale and cadaverous, the pulſe low and quick, 120 in the minute, there is a continual diarrhœa with pain and ſwelling of the abdomen, extreme ſenſibility to the touch, parched lips, a furred tongue, an intenſe thirſt, with frequent paroxyſms of vomiting, as if the ſtrangulation were ſtill unrelieved: the ſenſibility of the abdomen is ſuch, that the patient cannot ſuffer the ſlighteſt preſſure of the bed cloaths: the patient often paſſes the night in a ſtate of low and muttering delirium, and is not ſenſible till thoroughly rouſed. When ſuch a patient dies I find marks of inflammation in all the viſcera of the abdomen, various adheſions of the bowels to each other, effuſions of lymph, as in puerperal fever, and the inteſtines greatly diſtended with air; and when at any time I have ſaved the life of ſuch a patient, I have aſcribed it to the liberal uſe of laudanum and warm fomentations, but moſt eſpecially to repeated bliſters as large as the crown of a hat covering all the abdomen *.

With theſe two caſes of inflamed abdomen, that produced by diſtenſion of the bladder bears the cloſeſt analogy. When we ſpeak of the over-diſtenſion, and of the burſting of the urinary bladder, as cauſe and effect, we are guilty of a palpable ſoleciſm; nothing, I believe, can be more eaſily proved, than that the bladder never is ſo diſtended, as from mere extenſion, to give way; it is not burſt by dilatation, but is inflamed, becomes gangrenous in one ſpot, and then yields. If the bladder can be ſo diſtended, without rupture, as to contain ten pounds of urine! if it be ſo diſtended as to compreſs the inteſtines, fill the whole abdomen, and riſe to the ſcrobiculus cordis, without rupture! if it be thus diſtended by the third

* I hope ſoon to publiſh the prognoſtics and anatomy of inguinal and femoral hernia, and ſhall then deliver a variety of intereſting caſes and diſſections.

day of the ſuppreſſion, and yet continues entire to the eighth or tenth day! if the urine begin to be ſlowly diſcharged from the third day, ſo as to prevent any farther accumulation! how can it be that it gives way from mere extenſion? The expreſſion *over-diſtenſion and the burſting of the urinary bladder*, is ſo common and yet ſo deceitful, that I hold it right to ſay a few words on the dangers of diſtended bladder, which will at once explain this difficulty and complete the analogy betwixt this cauſe of inflamed abdomen, and thoſe other cauſes which I have already deſcribed.

The urinary bladder, which naturally holds a pound and a half of urine, is no ſooner dilated ſo as to contain two pounds, than uneaſy ſenſations are experienced: the deſire of paſſing the water is very ſtrong, and if the deſire be not gratified, if the bladder be ſuffered to be dilated beyond its natural ſtate, it loſes all power, and becomes paralytic. The deſire indeed continues, and the efforts are renewed in painful paroxyſms, with impatience and violence, but the power is gone, and the bladder continues diſtending more and more. If this paralytic ſtate of the bladder happen to a woman in labour, we perceive how eſſential the muſcular power of the bladder itſelf is to the expulſion of urine, and how effectual the force of the abdominal muſcles are in delivering the child, and how trivial that of the womb. The wedging of the head of the child into the cavity of the pelvis, is the firſt cauſe of the urethra being compreſſed and the urine retained, but no ſooner is the bladder thus diſtended than it becomes paralytic; the retenſion of urine does not ceaſe when the preſſure of the child's head is removed; the abdominal muſcles act powerfully, the child is delivered, the womb contracts, but the diſtenſion of the urinary bladder remains *.

* I aſcribe much or almoſt the whole proceſs of labour, the whole power by which the child is delivered, to the abdominal muſcles. In a woman whoſe breathing is injured, labour goes on ſlowly: While ſhe cries, (in place of giving effect to the abdominal efforts,) labour is retarded: When her ſtrength is entirely exhauſted, her voluntary efforts ceaſe, and delivery becomes impoſſible: When we aſſiſt with the lever, our efforts are unavailing, unleſs accompanied with labour pains, and we call to our patient to aſſiſt: When the placenta is to be expelled, it is by her voluntary exertions: In ſhort it were as fair to repreſent the expulſion of the fæces as a conſequence of the muſcular powers of the rectum, as to repreſent the expulſion of the child, as the conſequence of the muſcular contraction of the womb. The womb, the rectum, the ſtomach, are ſenſible to thoſe irritations which excite the abdominal muſcles, but are themſelves incapable of ſuch action, as to perform the functions uſually aſcribed to them. So entirely paſſive is the womb in the commencement of labour, that the abdominal muſcles operating, preſs down the womb till it is reſiſted by the brim of the pelvis, and if the pelvis be too wide to give the due reſiſtance, the womb, together with the head of the child, is altogether protruded. In the progreſs of labour, I never felt that contraction of the womb, that ſpaſm which is

When the urinary bladder is ſo diſtended as to fill the whole abdomen; when it reaches the ſcrobiculus cordis, and can riſe no higher; when the diſtenſion is at its extreme, and neither the bladder nor the ſpace in the abdomen can receive more, the general preſſure acts like an expulſatory power, and one of theſe things muſt happen: either the bladder muſt give way and lacerate, which it never does, ſo equally is it ſupported by the preſſure of the ſurrounding parts; or its orifice muſt dilate, and the urine begin to flow. The urine actually begins to flow from the third day of the ſuppreſſion, and whatever urine deſcends from the kidnies is evacuated in ſmall quantities from time to time: on the firſt day of ſuppreſſion the bladder riſes to the pubis; on the ſecond day its fundus reaches the navel; on the third day its fundus riſes to the ſcrobiculus cordis, and from this period it can be no further diſtended, however long the patient ſurvive.

Now this gradual and dribbling evacuation of urine, which empties the bladder, which begins with the full diſtenſion of it and continues till the eighth or tenth day, or till the bladder yields, has been long underſtood by good ſurgeons, and has been eſpecially named by the French writers, "Urine par regorgement." This evacuation of urine proceeding from over-diſtenſion, is moſt dangerous and deceitful. The friends felicitate themſelves that the urine begins to flow; they communicate their information to the phyſician, which he is too apt to believe; baſins and cloths wet with urine are eaſily produced, but the patient lies unrelieved; and the continued diſtenſion of the bladder is followed by univerſal inflammation of the abdomen: the inſenſibility and low delirium of incipient grangrene, are miſtaken for that relief which was expected from the flow of urine, till either hiccup comes on and the patient dies of fever and inflammation: or the urinary bladder actually gives way, and the acrid urine is poured out into the cavity of the abdomen. Caſes innumerable of this deſcription are to be found in the writings of the older ſurgeons; the quantity of urine correſponds ſo well with the quantity of drink, that the phyſician is apt to be deceived; and Colot tells of many caſes in which, while they believed this *overflow* of urine to be an incontinence, they actually

ſo curiouſly deſcribed; I felt never any ſpaſm but in the muſcles of my own arm, produced by a contraction of the womb, ſo unyielding, that the difficulty of turning ſeemed to me always to proceed from the abſolute indilatability of the womb, which indicates a contraction regularly proportioned to the emptying of its cavity; a contraction not the cauſe of delivery, but the effect; a contraction which is eſſential to prevent flooding, but is by no means ſo to the expulſion of the child.

miſtook the diſtended bladder for an abdominal abſceſs, and made appointments to open it by inciſion.

Let no ſurgeon then truſt to the reports of nurſes or friends, nor partake of their inconſiderate joy, but lay his hand upon the abdomen and tap with the finger, that he may diſtinguiſh the diſtended bladder and the fluctuation of the urine.

Since then the bladder ſuffers no farther diſtenſion from the third day, why ſhould it burſt? Not from laceration, for it is ſupported by the uniform preſſure of the ſurrounding viſcera, and the general tenſion of the abdomen: not by yielding ſuddenly, for it is diſtended to its utmoſt on the third day of ſuppreſſion, and yet ſeldom gives way before the tenth: not by attenuation, as a ſubſtance merely elaſtic gives way fibre after fibre, or burſts ſuddenly, for the bladder, even more than the womb, increaſes in thickneſs in proportion as it is extended. The term laceration never was more unfortunately applied than to the bladder; for when there is a breach in it, we find upon diſſecting it to be a *ſmall* round hole, ſuch as might be covered with the point of the finger; it is round, like a ſhot hole, with a rough and ragged margin, in ſhort, the rupture is at a ſingle ſpot, not longitudinal, but circular; the bladder, together with all the adjacent viſcera, is red and inflamed, while this ſingle point is black and mortified.

The ſigns of death are not merely ſimilar to thoſe of protracted labour or ſtrangulated hernia, but are eſſentially the ſame, as proceeding from the ſame cauſe. While the bladder is diſtending, the abdomen feels hard and firm, and the tumor is circumſcribed in the hypogaſtric region: when the bladder reaches the ſcrobiculus cordis, the ſymptomatic vomiting comes on, the pulſe becomes rapid, the belly becomes extremely ſenſible, and the patient cannot endure the gentleſt touch: and ſoon, the particular ſwelling of the bladder is concealed, becauſe the abdomen in general becomes tumid and elaſtic, like a drum, while the pulſe becomes frequent and irregular, the mouth is parched, the face ghaſtly, and the extremities cold; and when after a period of inſenſibility or low and muttering delirium, the patient expires, we find, upon diſſection, the bladder deep coloured, of a duſky red, thick and fibrous, or fleſhy: often the bladder has formed adheſions with the ſurrounding parts, and the viſcera of the abdomen are very generally inflamed before actual gangrene comes on, or the bladder gives way, and the patient uſually expires thus, not of rupture of the bladder, but of fever, irritation, and ſuppreſſed diſcharge. But when the bladder has actually yielded, its rupture

is accompanied with a ſenſe of ſomething giving way within, and we find that the opening is in the centre of the fundus, in one round gangrenous ſpot.

To thoſe who imagine that the extenſion of parts in the living body, is like that of the dead, an attenuation or mere dilatation! who expect to find the bladder, upon diſſection, thin and tranſparent! its real condition muſt appear very ſurpriſing. The bladder has not indeed time to grow by an actual depoſition of parts, but it is thickened by the fulneſs and turgeſcence of its veſſels, and by extravaſation into its cellular ſubſtance. I find always the veins extremely turgid, the muſcular faſciculi big, fleſhy-like, apparently injected with blood (as in a preparation where the bladder is injected with ſize, till the ſize is extravaſated among the coats). And while much blood is extravaſated into the cellular ſubſtance of the coats of the bladder, ſome exudes into its cavity, thence the urine is always deep coloured, obviouſly tinged with blood, and the laſt pound of urine drawn off, either by the catheter or trocar, from a diſtended bladder, is as thick and as deep coloured as coffee-grounds, tinges the inſtruments black, and is extremely fœtid. The ſlow and gradual diſtenſion of any living part is invariably accompanied with actual growth or a ſecretion of new parts; ſudden extenſion is accompanied only with a turgeſcence of veſſels, a fullneſs of blood in the part, and an extravaſation into the cellular ſubſtance: Inflamed viſcera have always from this extravaſation, a livid appearance: a ſtrangulated inteſtine, and a diſtended, and conſequently inflamed bladder, reſemble each other in this reſpect, and though ſuch parts ſeem gangrenous, yet, upon macerating them in water, the blood being waſhed out, they reſume their natural complexion.

That theſe ſeveral ſtages of dilatation of the bladder may be exemplified, I ſhall briefly recapitulate the circumſtances of ſuch a caſe: A woman having fallen in labour on Saturday morning, the head of the child deſcended into the pelvis, the preſſure on the urethra prevented any urine being diſcharged, the head deſcended lower and lower, till the ſcalp appeared, on Monday, protruding through the orifice of the vagina. In this ſtate of ſuffering the woman was permitted to remain till Tueſday evening, when ſhe was delivered. During four complete days the pelvis had been ſo occupied by the head of the child, that the urine could not be diſcharged.

The catheter was never introduced, nor did the medical attendants make even the ſlighteſt inquiry into the ſtate of the abdomen: the nurſe, when changing her linens, after delivery, was ſenſible of an unuſual degree of fulneſs, and the patient expreſſed her deſire to paſs her urine, but ſhe lay down, the deſire returned

again at the diſtance of two hours, and then ſhe paſſed about a pint of urine, next day ſhe ſuffered much from pain in the abdomen, with frequent deſire to make water, which ſhe diſcharged in tea-cup-fulls. On Saturday, (the eighth day of her diſtreſs) the phyſician who attended her was again called: her belly was now greatly diſtended, with great torments, difficulty of breathing, and oppreſſion, an intenſe thirſt which ſhe durſt not indulge, fever, furred tongue, and very frequent pulſe: about an hour before his viſit ſhe felt ſomething *within, at the navel, crack*, with great pain. For thirty hours preceding this ſhe had made no urine, nor did ſhe paſs one drop from that time forward. A few ounces of very fœtid and dark-coloured urine were now drawn off by the catheter, and on the ſecond day after, ſhe died delirious.

The abdomen was found, upon diſſection, univerſally inflamed: the bladder had given way, and the opening was found to be in the centre of the fundus, of a circular form, and with a black and gangrenous margin. Theſe analogies I could not leave unexplained, ſince they are the very grounds of our prognoſtics, and of our practice: Obſtructed urine, hernia, and lingering labour, reſemble each other ſo entirely, that in each caſe the ſame ſigns indicate the ſame danger. In the common fate of the patient thoſe three caſes unhappily agree but too well; DELAY IS THE GREATEST DANGER, and perhaps I have not, in this book, announced a maxim of more importance than this! I intreat the young ſurgeon to beware of delay: I warn him how inſidious the ſigns of danger are, which accompany ſtrangulated hernia: and as for child labour! every one acquainted with practice is conſcious how much more frequently the accoucheur has to lament the loſs of lives from unmeaning delays, than any harm done by the lever or forceps. In ſuppreſſion of urine it is moſt painful to ſee that the needful operation is uſually performed too late, that the patient's reſignation avails him nothing, and that the dexterous operator has no reward for his ſkill and dexterity. In theſe three caſes it requires talents, experience, and a ſpirit of obſervation, to conduct the patient ſafely: to give a fair chance of relief from the powers of the conſtitution, without expoſing the patient to danger, by delay: to decide, in ſhort, whether in a woman in travail, the abdomen be ſo much inflamed and the ſtrength ſo exhauſted as to require the help of the lever? or whether the ſtrength will not be reſtored by a little reſt, and the labour pains revived ſo as to complete the delivery? Whether, in hernia, the gut is ſtrangulated beyond a poſſibility of reduction, and the abdomen ſo affected as to admit of no delay? Whether, in

caſes of retenſion of urine, the abdomen be ſtill uninflamed ſo as to allow time for the good effects of fomentations, poultices, with a variety of trials, to force the paſſage? or whether the danger be not preſſing, requiring the bladder to be relieved at every riſk, either by forcing the catheter violently through every obſtruction, or by piercing it with the trocar? This I am well aſſured of, that there is no mode of operating, no kind of danger equal to that of delay. It were better that the ſurgeon cut into the bladder by any cruel method! better that he cut above the pubis, or made his way by inciſions in the perinæum, after the manner of the lateral lithotomy, than to delay the operation one hour beyond that in which the ſigns of inflamed abdomen manifeſt themſelves; for, after the rudeſt operations, the patient ſometimes ſurvives, but from delay thouſands have been loſt. It is, I believe, the opinion of all good writers, the maxim reſpected in all æras of our ſcience, the fair deduction from all the fatal or proſperous caſes on record, that we ſhould, in retenſion of urine, as in hernia, operate early.

But while I ſpeak thus the language of conviction, and repeat the injunctions of the moſt experienced of our profeſſion, I cannot be without ſome anxiety, leſt the young ſurgeon ſhould be led into raſh meaſures. I know it to be true that few have ſuffered by precipitation, ſuch is the natural averſion from operation and the reluctance of friends! while in my own limited practice I have ſeen many victims to timid meaſures and operation performed too late; yet I am inclined to treſpaſs with one obſervation more, which may ſerve to qualify the opinion I have laid down.

Inflammation of the abdomen is, in theſe ſeveral ſituations the principal danger, yet the whole aſpect of each caſe is not to be aſcribed to this cauſe: the low delirium, trembling pulſe, or even hiccup, do not portend death in diſtended bladder, in hernia, or in lingering labour, ſo abſolutely as in a gangrened limb: Theſe are not always ſigns of internal gangrene, often they manifeſt themſelves while the parts continue ſound: nor does every degree of ſwelling of the belly, vomiting, and faintneſs, infallibly indicate abdominal inflammation: many of the worſt ſigns proceed, in ſome degree, from mere irritation, and the patient's exhauſted ſtate. Thus in women in travail, the irritation of the head of the child and the inceſſant throes of labour; in ſtrangulated hernia, the fixed girded ſtate of the inteſtine, the drawing down of the ſtomach, the perpetual vomiting, and the attempts to reduce the gut, exhauſt the patient to an extreme degree: and in retenſion of urine, the fullneſs of the bladder and ſuppreſſion of the natural diſ-

charge, the toſſing and miſery of the patient, from deſire to paſs urine, and the ineffectual endeavours to introduce the catheter, exhauſt him, and he ſeems in the laſt ſtage of the ſuppreſſion, to lie almoſt in a comatoſe ſtate. In ſhort I have, in the courſe of my practice, obſerved that in all theſe caſes delirium comes on very early, in conſequence of the pain, fever, and want of reſt, for many days and nights. The inference then is plain: that though in ſuch caſes nothing but operation can ſave the patient's life, we never muſt ſo far prejudge the queſtion, as to ſay he is beyond the reach of art! Every ſurgeon of experience muſt have obſerved, that the woman who fainted when ſhe was raiſed into a proper poſture for being delivered, is rouſed by the pain of introducing the inſtruments to ſuch exertions, that her efforts greatly aſſiſt the operation of the lever or forceps: that in hernia the languor, hiccup, and vomiting ceaſe, the moment the ſtricture is relieved, the pulſe riſing to its level, and becoming comparatively firm and ſlow: and that in dangerous diſtenſions of the bladder, the abdominal pain ceaſes, the pulſe ſubſides, the toſſing of the patient, and all the ſigns of indeſcribable uneaſineſs, vaniſh as ſoon as the catheter or trocar are forced into the bladder: after thoſe ſeveral operations, the delirium goes off, the ſenſes become clear, the fever ſubſides, and the natural ſleep is reſtored.

In ſhort, the worſt ſigns are no ſure proofs of gangrene; the patient is perhaps exhauſted with ſickneſs, irritation, and pain; we never muſt prejudge the queſtion, ſaying, "It is ſurely too late to operate!" IN THE MOST HOPELESS CASES, LET THE PATIENT HAVE HIS CHANCE FOR LIFE.

And now that I am to analyſe the ſeveral operations, and teach that which is fitteſt in the ſeveral circumſtances to be performed; I ſhall ſay a few words on a ſubject of ſome delicacy: The talent of operating is not merely uſeful, as enabling the ſurgeon to perform ſafely, a diſſection which is not without danger, but ſtill more in giving him perfect poſſeſſion of his own mind. The degree of ſkill we have or ſuppoſe ourſelves to have, in operating, enters, I fear, too much into our feelings, when conſidering what is beſt to be done; for, in difficult circumſtances, a man timid and unſkilful in operation will be apt to linger and heſitate, a man bold and conſcious of operating, well, eſpecially if not familiar with practice, will be apt to hurry on with precipitation, to the moſt decided meaſures; but a man who is familiar with ſcenes of this nature, and has both performed many operations, and has ſtudied well the prognoſtics of danger or ſafety; will, if he be at the ſame time a fearleſs operator, proceed at once with reſolution and caution,

will neither hurry, nor delay too long, the meaſures which he thinks neceſſary for the patient's ſafety, and though no modeſt nor ingenuous man will ever, upon a retroſpect, be entirely ſatisfied with his own conduct, even when moſt ſucceſsful, yet one thus qualified at once to reflect deliberately, and act intrepidly, will, upon the ſevereſt ſcrutiny into his paſt conduct, find little reaſon for ſelf-reproach. I do regard ſkill in operating as of the utmoſt importance in giving the ſurgeon perfect ſelf-poſſeſſion: a bad operator will heſitate, in the moſt ſimple caſes, while a good and dexterous operator, like a man ſkilfull in the uſe of weapons, will not enter raſhly into difficulties, but being engaged from conviction, will bring himſelf through with courage. Let every young man then endeavour to become a DEXTROUS OPERATOR, for that will help to make him a JUDICIOUS SURGEON.

HISTORICAL REVIEW OF THE SEVERAL METHODS OF PUNCTURING THE BLADDER.

If we are entitled in any caſe to join pathology with ſurgery, to reaſon from the conſtitution and nature of the parts, and from the acknowledged dangers of operation, to any practical concluſions, it muſt be in the preſent caſe, where innumerable diſſections inſtruct us in the cauſes of death. Having eſtabliſhed this leading fact, that in caſes of protracted labour, of hernia, of obſtructed urine, of retroverſio uteri, (where alſo the diſtenſion of the bladder is the chief danger) the patient dies from no other cauſe than inflammation of the abdomen, let us ſee what aſſiſtance this theory will give in deciding the main queſtion, "Which is the leaſt dangerous method of tapping the bladder?" Firſt, If we make our inciſion above the pubis, and ſtrike the trocar from that point into the bladder, we cut parts contiguous with the peritonæum already inflamed. Secondly, If we cut from the perinæum, with inciſions reſembling thoſe of lithotomy, we make deep, unneceſſary wounds in a part of the bladder which, though lodged in the pelvis, ſometimes extends its inflammation, as in Cheſſelden's firſt experiments, to the cavity of the abdomen. Thirdly, If we ſtrike the trocar ſkilfully into the ſame part into the perinæum, without ſuch preliminary inciſions, the riſk of inflammation is greatly leſſened; and if we paſs the trocar from the rectum into the bladder,

we carry it through no thickneſs of parts, but transfix only two membranes: it is "like a ſtroke in the water": and the danger of inflammation is exceedingly ſmall. This ſlight index of the principles, according to which I mean to reaſon, will enable my reader to accompany me in the following critical review of the ſeveral methods of operating: perhaps it will enable him to anticipate many of my concluſions, it will ſurely incline him to adopt a mode of puncturing the bladder very different from that in common uſe.

FIRST METHOD.

The moſt common operation, becauſe the moſt obvious, is to penetrate from above the pubis. Every ignorant tyro, though unable to ſtrike the bladder from any other part, is able to plunge the trocar into it, at a point where he feels the fluctuation ſo plainly: that ſuperficial objection of the danger of wounding the peritonæum, ſo often urged againſt this method, is indeed of no importance; there is no danger of wounding the peritonæum, for the bladder when greatly diſtended, reaches high above the navel, carries the peritonæum, of courſe, before it, and expoſes a ſpace of ſeveral inches, in which we may perform our inciſions without incurring this kind of danger. But the abdomen is inflamed; the preliminary inciſions, which prepare for the introduction of the trocar, paſs, in a groſs old man, through ſeveral inches of fat and cellular ſubſtance: the inciſions muſt be wide in proportion to their depth: the canula is no ſooner lodged here than it is diſplaced, in ſome degree, by the contraction of the bladder, which, when emptied, ſubſides under the pubis: The canula ſtands ſo obliquely that the urine never flows with eaſe but by running out upon the wound, and by being injected among the cellular ſubſtance, it cauſes the wound to inflame, the wound by its proximity to the inflamed peritonæum ſoon mortifies, and thus notwithſtanding the temporary relief produced by the emptying of the bladder, the patient dies on the third or fourth day.

Thoſe who have been forced by fatal experience, to condemn the puncture above the pubis, have entered into no inveſtigation, and have not always been able to aſſign a cauſe for their ill ſucceſs; but it is well known that the wound is apt to grangrene, the operation is ſo eaſy that nothing but experience of its ill conſequences could prevent its being univerſally preferred; but the unfavourable iſſue of the operation is now ſo univerſally acknowledged, that even the difficult and deep inciſions in the perinæum are preferred.

SECOND METHOD.

To perforate the bladder with a trocar, from the perinæum, after making inciſions, like thoſe of lithotomy, is the ſole method now mentioned in ſyſtems of ſurgery; a harſh, cruel, and dangerous operation, which is indeed founded on one ſtill more atrocious, viz. driving the gorget through the neck of the bladder, as in the operation of lithotomy. This latter operation had fallen into utter contempt at the time when Sharp wrote his Critical Inquiry, and how any thing ſo nearly reſembling this cruelty, as the modern operation by inciſions in the perinæum could be thought of is to me a matter of ſurpriſe. "Beſides theſe methods (ſays Sharp), of drawing off the urine when under ſuppreſſion, they have alſo *made way for the reception of a canula by cutting open all the urethra from that part of the perinæum where cutting is performed by the greater aparatus*, and continuing the inciſion through the neck of the bladder; this they have done by the help of a grooved ſtaff, when it was practicable, and, where ſtrictures of the urethra prevented the introduction of a ſtaff, they have either cut, according to the beſt of their judgment, without any guide, or have puſhed in a trocar with a grooved canula, and cut upon the groove; when the inciſion was made they paſſed a gorget, and, by that means a ſilver canula, round which they twiſted ſome fine rag, that it might lie eaſier in the wound *." "This is indeed making ſurgical work, and puncturing the bladder after the manner of lithotomy up to the very letter of the text; yet I know not how to diſtinguiſh this from the operation now in common uſe."—"With *a view* to puncture the bladder from the perinæum the patient *ought* to be laid upon his back, and his thighs being properly ſeparated and ſecured by aſſiſtants, an inciſion *ſhould* be made of about an inch and a half in length *beginning at the commencement of the membraneous part of the urethra*, and continuing it *towards the anus* in a line parallel with, but at leaſt half an inch diſtant from, the rapha perinæi; in this manner the ſkin and cellular ſubſtance *ought* to be *freely* divided, which *puts it* in the power of the operator not only to introduce the trocar with more eaſe, but to avoid the urethra with more certainty than he *otherwiſe could do*. *This being done*, as the bladder is always much diſtended when this operation is neceſſary, it will be very eaſy diſtinguiſhed by *preſſure at the bottom of the wound*: but whether it ſhould be felt by the finger or not, there need be no

* Critical Inquiry, page 124.

heſitation in puſhing in the trocar a little *above* and to the left of the proſtate gland, which, if the parts have been freely divided, may be always diſcovered; and if the point of the inſtrument be carried a very little upwards, there can be no danger of wounding either the ureters or vaſa deferentia, which ſome have been afraid of in this operation, and at the ſame time there muſt be an *abſolute certainty*, if the trocar is carried deep enough, of its reaching the bladder."

Nothing can explain ſuch a blunder as this, but the hiſtory of the operation, which will prove, that at one time ſuch inciſions had a meaning, though now they have none. This operation was originally performed in a manner which no good ſurgeon would imitate, and for motives which no modern ſurgeon would avow. Dionis claims, in the following paſſage, the honour of inventing this operation for which the lithotomy of Frere Jaques had prepared the way, the theory of the two operations being expreſsly the ſame: "The method which Frere Jaques has taught us, (ſays Dionis) has put it in my head, that we may, with greater ſecurity, perform the puncture of the bladder in that point, where he makes his inciſion for extracting the ſtone; viz. in the body of the bladder itſelf, near the neck, ſo as to ſave the neceſſity of running the knife all the way along the urethra, for if we ſtrike in the ſcalpel, an inch from the perinæum, and pierce the body of the bladder near its cervix, we have reaſon to believe that the operation will be both more certain and leſs painful, ſince neither the urethra is opened, nor the cervix veſicæ injured; and the inflammation once gone, the urine, upon removing the canula, will paſs eaſily by the natural channel *." "This (ſays Dionis) we may truly call a cyſtotomy, ſince we actually ſtrike the *body* of the bladder."

* "Voilà la maniere dont on s'eſt ſervi juſqu'à préſent pour faire la ponction au périnée, mais celle que nous a apporté Frere Jacques pour tirer la pierre de la veſſie, et dont je vous ferai l'hiſtoire tantôt, *m'a donné occaſion de penſer qu'on pourroit faire plus ſûrement cette ponction à l'endroit de la veſſie où il fait l'inciſion pour le calcul, c'eſt-à dire dans le corps même de cet organe proche ſon col*; deſorte qu'il ne faut pas plonger le ſcalpel dans l'uretre & le faire paſſer par le col de la veſſie, qui dans une inflammation eſt tellement tumefié que rien n'en peut ſortir, et qu'on eſt en danger d'entamer ce col avec l'inſtrument pour lui faire un paſſage, ce qui peut redoubler les accidens et fruſtrer le malade du fruit qu'il attend de l'opération: mais ſi on enfonçoit l'inſtrument à un doigt du périnée, et qu'on perçât la veſſie dans ſon corps près de ſon col, je crois que l'opération en ſeroit plus ſûre et moins douloureuſe; *puiſqu' on ne perceroit point l'uretre, qu'on n'offenſeroit point le col de la veſſie, et que l'inflammation diminuée ou paſſée, l'urine ſortiroit par ſon chemin ordinaire* en ôtant la canule, et fermant la plaie qu'on panſeroit à la maniere accoutumée, et qui ſe guériroit auſſi facilement que les autres; car on ſçait à préſent que les plaies de la veſſie ne ſont pas mortelles comme on le croyoit autrefois, pourvû qu'elles ne ſoient pas d'une grande étenduë, et que quelque membrane voiſine ſe puiſſe coller contr'elles. Cette opération ſe doit appeller Kiſtitomie, parce qu'effectivement on ouvre le ſac urinaire."

Superficial men writing upon this point ſay, "that the paracenteſis of the bladder is to be performed like the operation of lithotomy!" like what lithotomy they know not! they have no deſign of preſcribing for this ſimple operation theſe horrible inciſions! they have no apprehenſion that it is the lithotomy of Frere Jaques, they have to deſcribe! they have no ſuſpicion of having travelled backwards two hundred years in the ſcience, and aſſimilated the uncouth operations of antique quackery with modern ſurgery. They have no apprehenſion that the paracenteſis veſicæ was ſo performed, with no better deſign than that of ſtriking the body of the bladder behind the gland, leaving the cervix veſicæ entire; nor that it was ſo performed that the urine might flow more eaſily, neither did they ever reflect that by ſtudying the anatomy of the parts, this ſame paracenteſis veſicæ might be performed with the ſimple trocar, with as perfect ſecurity and almoſt as little danger as paracenteſis abdominis.

Is all this butchery neceſſary? Is a man entitled in any degree to the appellation of ſurgeon, who needs to make inciſions like thoſe of lithotomy, before he can diſcover where the urinary bladder lies? is it neceſſary that the ſurgeon not only diſtinguiſh the bladder, but feel the fluctuation of the urine, before he dare introduce his trocar? The conſequences of ſuch inciſions I can report but too truly, for I have hardly ſeen any other performed: the effects are nothing ſhort of thoſe performed in lithotomy, the danger indeed is greater, nothing is wanting to make it more cruel, but the actual pulling out of a ſtone with the forceps, but, the fever, abdominal inflammation, and obſtructed diſcharge, form, in the preſent caſe, an aweful counterbalance, to this pulling out of the ſtone with forceps; for that violence is practiſed only in a healthy patient, and in ſound parts, whereas theſe inciſions for the paracenteſis, are practiſed only in diſtended bladder and inflamed abdomen! the inflammation of the abdomen is not arreſted by merely emptying the bladder, the parts on the contrary, fall into gangrene, and the patient dies.

We thus find that the excellency of this method was ſuppoſed to conſiſt in ſtriking the bladder in its body, leaving the neck entire; an excellency which no good ſurgeon will acknowledge, ſince it implies an oblique and dangerous wound, quite unlike that which he makes in performing the lateral operation. But the operation is not only eſſentially bad, but extremely difficult to perform. The young ſurgeon, when preparing to operate, turns up his ſyſtem of ſurgery, reads the chapter on paracenteſis, and ſays to himſelf, in the words of the author, "I will perform it in the ſame manner as lithotomy is performed;"

how unlike the two operations are, he never is aware, till he is engaged in a diſſection which he cannot complete. There is no ſtaff in the bladder to guide his inciſions, which, even in lithotomy, are not always performed with confidence: he, after deep and irregular inciſions in the perinæum, ſtrikes in his trocar at random, and miſſes the bladder, or transfixes it, or buries the point of it in the enlarged proſtate, or cuts the urethra away from the gland: Theſe are not hypothetical ſtatements of poſſible blunders; I have witneſſed theſe accidents, and drawn the plans which I now preſent to my reader, in the moment of the operation, or in the time of diſſecting the body.

There is no more heinous fault than that of practiſing ſurgery without a knowledge of anatomy, unleſs it be that of ſtudying anatomy independently of pathology, and applying the deſcriptions of parts in the ſound body, to the ſame parts in a ſtate of diſeaſe. The effect of the enlargement of the proſtate gland, upon our operations, has (as I know by fatal examples) been but little ſtudied. The plan 1ſt, of enlarged proſtate is very ſimple, I have repreſented in a true drawing the enlarged proſtate which in truth fills all the lower part of the pelvis, and preſents itſelf to the ſurgeon, ſo that without a perfect conception of its form, and actually feeling it with the finger, he can perform no operation without blundering. The extent of the enlarged gland is deſignated by the figures (a a a); the contracted bladder (for it thickens and corrugates in proportion as the gland grows) is marked (b b); the membranous part of the urethra is marked (c); while the original and natural ſize of the proſtate is marked in dotted lines; and let it be obſerved that as the gland enlarges, the ſpace (d) betwixt the ureters and veſiculæ ſeminales of the two ſides, is increaſed; by being removed from each other, they leave a wider ſpace open to the puncture of the trocar, ſo that they cannot be wounded, and though it were not ſo, the wounding of the veſiculæ, though it has been repreſented as a mighty objection to the puncture from the rectum, is none: the veſiculæ would heal as eaſily as any other part, and the ureters would reunite (unleſs indeed they were cut acroſs), as eaſily as the bladder reunites, but this is a queſtion of no importance, the operation is performed in people advanced in years and ruined in conſtitution, and the queſtion is not about ſaving the organs of procreation from any ſlight injury, but about ſaving life.

The plan 2d, preſents the ſame parts in a vertical ſection. The ſtaff is ſtopped at (a), in the membranous part of the urethra, by a ſtricture. The gland (b b) is repreſented as enlarged, filling the lower and fore-part of the pelvis, and

compreſſing, in ſome degree, the rectum. By the help of this plan I ſhall deſcribe certain errors which I have ſeen repeatedly committed, and which I hold it particularly important for the young ſurgeon to be acquainted with: When the ſurgeon *is to make "inciſions in the perinæum, an inch and a half in length, at the commencement of the membranous part of the urethra, and continuing it towards the anus in a line parallel with, but at leaſt half an inch diſtant from the rapha perinæi!"* he has to operate according to precepts ſo inconſiſtent with the actual relations of the parts, ſo unintelligible to one who is an anatomiſt, and ſo nugatory to one who is not, that he muſt cut at random: having made deep inciſions in the perinæum, he no ſooner begins "to ſearch for the bladder with his finger in the bottom of the wound," than he directly encounters the enlarged body of the proſtate: If he underſtands what he feels and diſſects backwards till he diſtinguiſhes the bladder itſelf, he actually reaches that part of the bladder which lies upon the rectum; (viz. the ſpace betwixt the veſiculæ) he arrives exactly at the ſame point which he touches in perforating from the rectum, and no one will deny that he might perforate with more ſecurity and leſs pain from the rectum, through its thin walls, than from the perinæum by theſe inciſions: But, having made his way to the gland, he points his trocar (which is uſually too ſhort for any purpoſe, and not at all appropriated for this) directly upon the gland, drives it deep into its ſubſtance, and no urine flows, or flows only when both trocar and canula are withdrawn.—How this happens it is not difficult to conceive: "An old man who, for the laſt twelve or fourteen years of his life, was ſubject to occaſional difficulty, was at laſt affected with entire ſuppreſſion, ſo that for five days preceding the operation, he had not paſſed one drop of urine: all attempts to introduce the catheter, or give relief by paſſing bougies, were in vain, the tumid bladder was felt above the navel, he had continual ſtraining to void his urine, with ſickneſs, thirſt, and a feveriſh pulſe. But in his diſeaſe, nor in his preſent diſtreſs, there was nothing peculiar nor worthy of notice. A young ſurgeon performed the operation of puncture in perinæo by all the uſually preſcribed rules. After diſſecting into the hollow of the pelvis, he ſtruck his trocar deep, but upon withdrawing the ſtillet, no urine flowed, it was only when he was withdrawing the trocar alſo, that a little urine run out; nothing intimidated by this ill ſucceſs, he ſtruck his trocar once more, now the urine flowed freely; the canula was left in its place, the urine continued to be diſcharged, but the abdomen inflamed and the man died."

"Upon diſſecting the body, the firſt thing that could be obſerved was the

fundus of the bladder hanging flaccid upon the point of the canula, which projected ſome inches into its cavity; upon opening the bladder, the canula was ſeen in its place; upon withdrawing the canula and cutting out the parts from the pelvis, laying them on the diſſecting board, and inveſtigating the inner ſurface of the bladder, not the ſlighteſt mark of puncture was to be found; ſo that had not the trocar been ſeen in its place, upon opening the abdomen, no one could have believed that it had penetrated!"

This caſe I noted down as peculiarly inſtructive; an operation eſſentially bad was performed in a manner ſo rude and barbarous, that a coroner's inqueſt might have taken cognizance of the affair: This culpable homicide was a conſequence of the ſame ignorance of anatomy, which makes many an operation for the ſtone miſcarry: There is no wonder if a ſurgeon who would, if he were cutting for the ſtone, nick the urethra ſeveral times before he was ſure of having divided it, ſtrikes his trocar twice before he punctures the bladder: This gentleman directly encountered the diſeaſed proſtate without knowing it! He not only plunged into its ſubſtance, but that tranſverſely, ſo as to transfix the gland in the direction of the dotted line (c); for the point of his canula being buried in the farther ſide of the gland, no urine flowed when he firſt withdrew the ſtillet! but while he was withdrawing the canula, after he had drawn its point from the farther lobe of the gland, and before it was withdrawn altogether, it received, in paſſing from ſide to ſide, a few drops of urine which flowed out: The ſecond time he ſtruck in his trocar, it neither paſſed deep behind the gland, which is the proper intention in this method, nor into the ſubſtance of the gland, and through its thickneſs into the cavity of the bladder, as uſually happens, but directly onwards in the line of the natural canal, in the direction (c), firſt through the urethra, and then through the centre of the gland. Thus it happened, that, after death, no wound of the trocar could any where be found; as for the death of the patient there cannot be a matter of wonder.

That the ſurgeon can hardly perforate behind the diſeaſed gland through the body of the bladder itſelf, except by a very deep and dangerous diſſection, is what I have always conjectured, when obſerving the ſize of the diſeaſed gland, every operation I have ſince witneſſed has contributed to ſtrengthen a ſuſpicion, which has been abſolutely confirmed by a miſcarriage more extraordinary and leſs pardonable than that which I have juſt mentioned; for though it is unpardonable to begin the operation by inciſions in the perinæum, without introducing the finger

in ano, to feel the condition and ſize of the gland, yet nothing can exceed the folly of actually perforating from the rectum, of having the finger introduced for the purpoſe too of guiding the trocar, without eſtimating the extent of the gland, or chooſing a trocar ſufficiently long.

A gentleman being reſolved to practiſe the neweſt piece of ſurgery; viz. puncturing from the rectum; uſed, in ſpite of every remonſtrance on my part, a common trocar, hardly more than three inches long! a common trocar for tapping the belly in aſcites! The conſequence was moſt lamentable, for the inſtrument being buried in the ſubſtance of the enlarged gland (as is repreſented by the trocar, marked (f), figure 2d), not one drop of urine flowed; the trocar and canula were both withdrawn, and the operation of puncturing above the pubis performed.

If men will ſo neglect anatomy as to miſs the membranous part of the urethra, in cutting for the ſtone, although guided by the ſtaff! if a ſurgeon be ſo ignorant of the proportion of parts, as to take a common ſhort trocar in his hand, with the deſign of perforating the bladder from the rectum! is there any wonder, that ſuch uneducated or unthinking men, miſs their ſtroke? It is not I declare, for the purpoſe of decrying an operation itſelf good, that I betake myſelf to this moſt inſidious of all arguments, the argumentum ad hominem: I regard this as a bad operation, even though performed by a John Hunter, a Lynn, or Earle; and it is my duty to warn thoſe who will perform it, that it is an operation differing in every reſpect from that of lithotomy, and infinitely more dangerous. While the bladder is ſo eaſily acceſſible to a good ſurgeon and anatomiſt, at various points, let us hear no more of performing the paracenteſis veſicæ, like the lateral lithotomy with deep inciſions. Surgeons ſeem univerſally to have adopted the bloody ſentiments of Dionis, who, when he found the catheter could not paſs, grew quite deſperate, exclaiming in the homely language of his time, "Nothing can now ſave but a puncture from the perinæum, he muſt piſs or die." "Parce qu'il faut qu'il piſſe, ou qu'il meure."

THIRD METHOD.

We find then that this doctrine of ſtriking the body of the bladder behind the gland, had continued through ages, and had its influence on more than one operation; but theſe preliminary inciſions in the perinæum, were never thought of by any ſurgeon till the ſtudy of anatomy began to decline. Collot, and Dionis, and Mareſchal, and La Faye, knew well how to ſtrike the trocar into

the bladder, without diſſecting for it, or feeling it with the finger "in the bottom of the wound"; it was at firſt the univerſal practice to ſtrike a long and ſlender knife from the perinæum into the bladder, when the catheter could not paſs; next a trocar was ſubſtituted for the knife; and finally this proceſs was improved into an operation highly deſerving of notice.

Enmity brings to light many ſecrets. Collot, the irreconcileable enemy of Frere Jaques, explains to us, "that for a long courſe of years it had been the practice of the French ſurgeons, whenever inſuperable obſtructions in the urethra prevented the introduction of the catheter, to take a ſlender and dagger-ſhaped knife, and ſtrike it at random from the fleſhy point of the hip upwards, along the ſide of the rectum, towards the bladder, which being diſtended with urine, met the ſtroke, and the urine was thus diſcharged, but with very ſmall hopes for the life of the patient."—"Sometimes (he adds) ſuch patient having a ſtone, the operator was naturally induced to hook it out with his fingers, or introduce forceps *;" and to this ordinary reſource of the ſurgeon, in caſes of ſuppreſſion of urine, does he refer, and perhaps fairly, that operation of Frere Jaques which he affected to have learnt by inſpiration.

Secondly, This rude operation was neither diſuſed nor yet improved in the time of Dionis, who directs the ſurgeon, "after placing his patient as for the operation of lithotomy, the legs bended, the knees ſeparated, and the aſſiſtants holding the patient firm, to take an inſtrument forged on purpoſe, ſhaped like a ſcalpell, ſtraight pointed, and from four to five inches long, and plunge it into the bladder, from that part of the perinæum by the ſide of the rapha, where the inciſion of lithotomy is made, the ſurgeon being ſenſible of having pierced the bladder by the flowing of the urine; but before withdrawing the knife, with the right hand, he muſt ſlip in a probe along it with the left, and thus provide the means of introducing a ſilver canula, which is to remain in the bladder till the obſtruction be relieved †."

* "Il eſt arrivé quelquefois que le chirurgien arrêté par les obſtructions faites dans le canal, ne pouvoit paſſer ſa ſonde pour tirer les urines retenuës, il ſe ſervoit d'un petit inſtrument en *façon de poignard, et il faiſoit* une ouverture au hazard et ſans regle au bas de la feſſe dans *l'endroit le plus charnu*, il couloit le poignard le long du rectum, et il alloit percer *le corps de la veſſie*, laquelle étant pleine d'urine, favoriſoit l'operateur; ces urines ramaſſées, s'échapoient, les malades ſe trouvoient ſoulagez à la verité, mais toûjours avec peu d'eſperance de vivre.

"Parmi ces ſortes de malades il s'en rencontroit qui avoient une pierre." COLOT, p. 33.

† "Il ne faut pas néanmois laiſſer périr un malade, et il n'y a qu'une ponction au périnée qui puiſſe lui ſauver la vie, parce qu'il faut qu'il piſſe ou qu'il meure; c'eſt au Chirurgien à en avertir les parens ou les amis

The operation repreſented by Dennis, and no doubt practiſed in Holland, was preciſely the ſame with that which I have juſt deſcribed, but that practiſed by Raw was more refined, he uſed not long, dagger-like biſtouries, ſuch as Dionis deſcribes, but the common trocar. "I have known him (ſays Dionis) give relief by ſtriking into the bladder at the ſame point where he cut in his operation for the ſtone, a common triangular trocar ſuch as is uſed in hydrocele, but bigger and larger *."

Fourthly, If Frere Jaques, in the invention of his peculiar manner of cutting for the ſtone, followed the analogy of that puncture of the perinæum, which was performed by ſtriking in a dagger-ſhaped biſtoury; Foubert, in the invention of his operation for the ſtone, took the analogy of this improved puncture with the trocar. He made the puncture with the trocar, (as I have already related) the firſt ſtroke in his operation, and he made a groove in the ſide of his canula, to ſerve as the conductor or ſtaff along which his lithotome or inciſion knife was run home into the bladder. What degree of praiſe we ſhould aſſign to his invention, it is hard to ſay, but it is gratifying to trace the links by which every ſucceſſive invention is connected: each of theſe daring inciſions or ſtabs rather, (made with the pointed biſtoury, piercing from the hip to the bladder,) ſerves to give us confidence in ſtriking the trocar from the perinæum through the centre of that triangle of which the tranſverſe muſcle forms the baſe; and the whole hiſtory of theſe

du malade, et à leur faire le prognoſtic tel que le demande la nature de la maladie. Ayant enſuit diſpoſé l'appareil, il faudra ſituer le malade ſur le bord du lit et le coucher à la renverſe les deux cuiſſes écartées et es jambes ployées de maniere que les talons touchent les feſſes, faiſant tenir les jambes en cet état par deux ſerviteurs, et par un autre lever le ſcrotum en haut: *puis l'opérateur prendra un inſtrument fait exprès en* FORME DE SCALPEL, étroit, pointu, et long de quatre ou cinq pouces, tel qu'il eſt marqué par E. *Il le plongera droit dans la veſſie*, en commençant la ponction à côté du raphé, au même endroit où ſe fait l'inciſion dans la lithotomie, et il connoîtra qu'il eſt dans la veſſie par l'urine qui ſortira à côté de l'inſtrument; mais il faut avant que de le retirer, couler une ſonde droite F. à côté du biſtoury juſques dans la veſſie. Cette ſonde ſe conduit de la main gauche, et l'inſtrument ſe retire de la main droite, dont on prend enſuite une canule d'argent G. longue de quatre pouces, qui a deux anneaux à ſa tête, dans leſquels ſera paſſé un ruban H." DIONIS, p. 196.

* "Collocantur eodem modo ægri, ac ſi lithotomiam inſtitueremus; lanceola chirurgica ad latus perinæi aperturam facimus uſque in veſicam eodem loco, ubi magno adparatu calculum veſicâ extrahimus. Quam primum urina nobis obvia fit, certi ſumus nos veſicam penetraſſe. Tunc juxta inciſorium rectam fiſtulam in veſicam intrudimus, dein argenteam fiſtulam per quam ægri urinam evacuamus.

"Novi celeberrimum Rau tali in caſu per fiſtulam, in qua triangulariter acuta cuſpis continebatur, ſimilem inſtrumento, quo aqua ſcroto evacuatur, Gallice Troiſcar dicto, ſed longiorem et craſſiorem urinæ viam paraſſe, hancque eundem in veſicam intruſiſſe, ubi lithotomiam ſolebat inſtituere." DENNIS's Ob. Chirurg. De Calculo, p. 141.

operations ſerves as a code of rules explaining to us what it is poſſible to do even by a rude inciſion, what it is eaſy and ſafe to do by a well regulated puncture; ſuch I account Mr. Foubert's, he had not the ſame deſign with Collot, Dionis, and Raw, of ſtriking the bladder behind the gland, he did not attempt to ſtrike his trocar in that direction in which they guided their knife, along the ſide of the rectum; he entered his point higher in the perinæum, nearer the root of the penis, cloſer to the arch of the perinæum, and aimed at the fore part of the bladder above, and a little to one ſide of the gland. Foubert's method is as diſtinct from that of Raw, as the puncture above the pubis, from the puncture in perinæo. That Foubert ſometimes miſſed the bladder is not to be denied, but it was in cutting for the ſtone in a contracted bladder, which could not perhaps at any time have contained half a pound of urine, and at the moment of the puncture, no more perhaps than two ounces.

How different this from the ſtate of the bladder in ſuppreſſion, when its fundus reaches to the navel, and its broader and lower part occupies all the pelvis. The puncture is performed on the broadeſt part of the bladder, where it lies under the arch of the pubis; the point of the trocar enters about the level of the urethra, where there is little of the diſeaſed gland; to hit the bladder, not from behind the gland, but from its fore part thus, is as eaſy as to plunge into its fundus from above the pubis: no tyro could miſs the ſtroke: if the ſurgeon keep cloſe to the arch of the pubis, without actually encountering the bone with his trocar, he cannot fail to ſtrike the bladder fair.

For this operation the patient is to be laid as for lithotomy, on the ſide of his bed, on his back, the knees raiſed and ſeparated by aſſiſtants, and the heels placed firm upon the bed, near the buttocks, or held by the aſſiſtants on each ſide; a ſkilful aſſiſtant is to compreſs the abdomen with both hands, ſo as to depreſs the bladder and keep it ſteady.

The ſurgeon is to imagine a line drawn in the direction of the tranſverſe muſcle; i. e. from the anus to the tuber iſchii, and the centre of the triangle which that line forms with the arch of the pubis, or a little higher than the centre, is the point at which the trocar is to enter.

The catheter is to be introduced as far as it will paſs, to prevent any harm to the urethra, and to direct the trocar; the forefinger of the left hand is to be paſſed deep into the rectum, to feel the bladder or the ſwelled gland, and to enable the ſurgeon both to judge of the relation of parts, and to keep them in ſome degree

ſteady; the trocar, which muſt be long, ſlender, and a little curved, muſt have a big, round handle, and the ſurgeon taking the handle in the palm of his right hand, and laying the fore-finger along the canula to ſteady it, is to enter it, at firſt, directly into the part inclining a very little upwards, and to carry it on ſlowly, ſteadily, and without fear, until he feel it in the open cavity of the bladder, when, by withdrawing the trocar, the urine will flow out.

"The operation of paracenteſis, though it be no more (ſays Dionis) than a ſimple puncture, requires on the part of the ſurgeon, a perfect knowledge of anatomy, and of the relation of parts, both to conduct his inſtrument directly into the bladder, and to avoid encountering any important parts; it is indeed alarming to a ſurgeon little verſed in anatomy, though extremely eaſy to thoſe who are *." To this opinion we very willingly ſubſcribe; if the operation be at all perplexing, it muſt be to thoſe only who are ignorant of anatomy, but I have gone a ſtep farther in proteſting that it can be difficult to no one who has diſcretion and courage; and that it is as eaſy to ſtrike the broad anterior ſurface of the bladder under the arch of the pubis, as to plunge into it from above.

FOURTH METHOD.

It will appear from theſe hiſtorical ſketches, that each operator, in puncturing the bladder, either actually operated as in cutting for the ſtone, or followed at leaſt the analogy of his own favourite lithotomy, or that of the age in which he lived. Before the times of Frere Jaques and Dionis, a method was practiſed by La Faye, Morand, Petit, Mareſchall, and the other lithotomiſts of Paris, allied with the apparatus major, an operation which, though very fatal, when practiſed for the extraction of a large ſtone, or indeed of any ſtone, is excellently adapted for emptying the diſtended bladder. When theſe ſurgeons deſigned to tap the urinary bladder, they proceeded in one of two ways; either they preſſed the ſtaff home into the bladder, and cut, as in lithotomy, running in their blunt gorgets upon the ſtaff: or, being unable on account of the obſtruction to paſs the ſtaff into the bladder,

* "Cette operation quoiqu'elle ne conſiſte que dans une ſimple ponction, demande qu'un chirurgien ſçache par l'anatomie la diſpoſition des lieux où il la fait, tant pour conduire ſon ſcalpel droit dans la veſſie, que pour connoître quelles ſont les parties que ſon inſtrument peut offenſer en chemin faiſant; il faut auſſi qu'il l'ait vû faire pluſieurs fois avant que de l'entreprendre, car elle effraye un chirurgien qui n'eſt pas fort verſé dans l'anatomie, ou qui n'a jamais vû faire cette ponction: mais ceux qui en poſſedent la pratique la trouvent une des plus faciles de la chirurgie." Dionis, p. 179.

they ſtruck in the trocar at random, aiming at the urethra, and entering the point of the trocar where the ſtaff was intercepted by the obſtruction.

No detail which relates to operations, ſo important and critical, can be too particular. "For the operation of paracenteſis, the patient (ſays La Faye) is to be laid upon his back, as for the operation of lithotomy, and a ſtaff introduced if poſſible, into the bladder, and always as low at leaſt in the urethra as the obſtruction will allow: Then the ſcrotum being held up by an aſſiſtant, an inciſion is made with a lithotome, cloſe by the rapha, upon the groove of the ſtaff, and then the operation proceeds, as in cutting for the ſtone; but ſhould the ſtaff not have paſſed into the bladder, the operation is extremely difficult, and it becomes *the ſurgeon, when no longer directed by the ſtaff, to reflect well on the poſition and ſtructure of the parts:* and ſhould he be unable, after his outward inciſions, to open the urethra with his lithotome (or inciſion knife), *let him enter a ſlit trocar into the urethra, and then, by running his biſtouri along the ſlit, he will be able,* upon withdrawing the canula, to make an inciſion into *the neck of the bladder.* Petit and Morand have perſormed this operation with ſucceſs."

"The inciſion being made, a gorget is firſt paſſed into the bladder; the iſſue of the urine proves that it has entered, and then the gorget being held ſteady with one hand, with the other a canula, wrapped round with linen rag, is paſſed along the gorget into the cavity of the bladder *."

* "Le malade eſt ſitué de la même maniere que pour l'operation de la taille au grand appareil. On introduit une ſon de canelée dans la veſſie, ſi on le peut, ou du moins auſſi avant dans l'uretre qu'il eſt poſſible, pour ſervir de guide. Les bourſes levées par un aide, on inciſe avec un lithotome ordinaire à côté du raphé et ſur la canelure de la ſonde, ſi elle eſt aſſez avancée, et l'on ſe conduit comme dans l'opération de la taille. Si l'on ne peut faire l'inciſion ſur la ſonde, cette opération eſt beaucoup plus difficile; le chirurgien obligé de travailler ſans ce guide, doit ſe bien repreſenter la ſtructure et la poſition des parties ſur leſquelles il opere. Si après avoir fait l'inciſion aux tégumens, il ne peut parvenir à ouvrir l'uretre, il y introduit un trocar dont la canule eſt fendue; et à la faveur de ſa fente, il porte un biſtouri pour faire une inciſion à cette partie, après avoir ôté le trocar. MM. Petit et Morand ont pratiqué cette méthode avec ſuccès.

"Lorſqu'on ne peut introduire la ſonde aſſez avant dans l'uretre pour ſervir de guide, on peut alors porter à l'endroit où finit l'inciſion de la taille laterale, un trocar avec ſa canule fendue, et gliſſer le long de cette fente qui ſert de canelure, la pointe d'un biſtouri, pour faire une inciſion ſuffiſante.

"On fait l'inciſion au milieu des duretez, on emporte celles qui ſont exterieures en coupant le moins de chair que l'on peut. On comprend dans l'inciſion la fiſtule, les calloſitez qui l'accompagnent, et même la glande proſtate, ſi elle eſt dure et ſchirreuſe, et s'il eſt poſſible d'y atteindre.

"L'inciſion faite, on introduit dans la veſſie un gorgeret; la ſortie de l'urine prove qu'il eſt entré. On dégage la ſonde et on la retire; puis tenant d'une main le gorgeret, on conduit à ſa faveur de l'autre main juſques dans la veſſie, une canule garnie d'une petite bandelette de linge. On retire enſuite le gorgeret, et l'on fait porter le malade dans ſon lit, après avoir appliqué une compreſſe ſur la plaie." De La Faye, page 212.

My reader will not all at once conceive why, after the trocar is introduced, a knife ſhould be run in along the groove, and will ſay within himſelf, "Surely when either the ſtaff or the canula had paſſed into the bladder the purpoſe of the operation muſt have been accompliſhed? Why then make needleſs inciſions into the neck of the bladder?" But let it be remembered that theſe were in all ages extraordinary reſources in ſevere and anomalous diſeaſes, where the ſurgeon could hardly tell whether obſtruction or ſtone or diſeaſed bladder was the cauſe of the complaint; that every one operation was deduced from ſome other; that De La Faye is here inconſiderately deſcribing, inſtead of the ſimple operation of paracenteſis, the deſperate reſource of introducing a canula: that he is unconſciouſly repreſenting the operation of the canula, inſtead of paracenteſis, we are aſſured by a ſucceeding paragraph *, in which he teaches how to inject the bladder with barley-water, honey, and various other medicines, when ulcerated or foul.

But this operation, if repreſented with a little more plainneſs and ſimplicity, would appear highly worthy of attention, and the analogy of the apparatus-major, the worſt method of lithotomy, would be univerſally followed as the beſt and ſimpleſt method of performing the operation of paracenteſis. Thoſe old ſurgeons introduced a ſtaff, and at the place where it ſtopped in the perinæum, they made an inciſion, cut into the urethra, run their probes, or dilators, along the membranous part of it, and forced their way into the bladder, by dilating or cutting the neck.

Let us reflect on this operation and its conſequences. When the catheter is obſtructed and can by no means be forced into the bladder, what is the difficulty? ſome ſtricture, amounting almoſt to obliteration of the membranous part of the urethra, or more frequently an induration of the proſtate. Where is the catheter arreſted? always near the point of the proſtate gland; it ſtops juſt where the point of the catheter paſſes the finger laid on the perinæum, and at that place where it is felt upon introducing the ſame finger into the rectum. If the catheter could

* "Quand la veſſie eſt baveuſe ou ulcerée on y fait des injections par le moyen d'une ſonde à poitrine, que l'on y introduit par la plaie après en avoir ôté la canule. On fait d'abord ces injections avec une eau d'orge, à laquelle on ajoute quelque tems après du miel roſat, et enſuite une dixième partie d'eau vulneraire. On en fait auſſi par le canal pour le laver et le nétoyer. Le ſeton doit être très-long. La partie qui n'eſt pas encore entrée dans le canal doit être roulée et enveloppé dans un linge. Chaque fois qu'on panſe la plaie on en tire et on en coupe ce qui a été dans le canal depuis le dernier panſement: l'on doit avoir graiſſe auparavant la portion qui doit y entrer. Si les duretez du perinée réſiſtent dans la ſuite à ces remedes, on fait quelques frictions d'onguent mercuriel, et l'on applique au lieu de l'emplâtre du dyachylum, celui de *Devigo, cum mercurio quadruplicato.*" De La Faye, page 212.

be thruſt through this obſtruction and driven into the bladder, even at the expence of ſome violence, and much blood, would ſuch rudeneſs be fatal? by no means, ſuch an operation would, on the contrary, give preſent relief.

If either by thus puſhing on the catheter with ſome laceration of parts within, or if, by a ſmall inciſion in the perinæum, the courſe of the urethra could be recovered, and a probe paſſed along it, or the common grooved directory, or any ſuch inſtrument introduced, would ſuch injuries be at all equal to thoſe I have enumerated? or would the danger of inflammation, when the neck and natural opening of the bladder were thus forced, be at all comparable with theſe dangers, which muſt accompany a wound of its body, whether from above the pubis, or from behind the proſtate gland? ſurely not. If ſurgeons would but condeſcend to make themſelves correctly maſters of this piece of anatomy; if, having paſſed the male catheter as far as it could go, they would then, with a ſmall inciſion, ſeek out the obſtructed part of the urethra, they would be able either to help on the catheter with the probe, or to dilate the urethra, or to force the proſtate gland, by paſſing a female catheter ſtraight on from the point where the male catheter ſtops; and a wound ſo bloodleſs, ſo far from the pelvis or abdomen, ſo nearly reſembling the thruſting on of the catheter, affecting merely the neck of the bladder, might be reſorted to early, and many precious lives be ſaved.

FIFTH METHOD.

If there be a method which may be put in competition with this, it is that of puncturing from the rectum. I am not indeed ignorant that this way of reaching the bladder lies under the formal proteſt of ſome writers, but they are of thoſe who have written about ſurgery by conjecture, whoſe authority ſtands on no other grounds than reaſoning; and what reaſoning can diſcover any thing ſuperior in the common and rude operation of making inciſions in the perinæum, when compared with this of puncturing from the bladder? The ſurgeon muſt have little confidence in either his reaſoning or experience, who ſays, "we ſhall therefore diſmiſs this method (viz. the puncture from the rectum) without farther conſideration." Yet this is wiſely ſaid, for the queſtion will bear no reaſoning; firſt an operation is deſcribed, in which after inciſions long and deep in the perinæum, a trocar is plunged into the bladder, ſometimes through the diſeaſed proſtate, but more frequently behind that gland, if the deſign of the operation be truly fulfilled; and next, the puncture from the rectum is proteſted againſt becauſe the trocar may wound forſooth the veſiculæ ſeminales, when in fact the operation by inci-

ſions in the perinæum brings the trocar to that very point, where, if ſtruck from the rectum, it muſt enter.

The project of puncturing the bladder from the rectum, originated, like many valuable inventions, in accident. The ſurgeon introducing the finger into the rectum, felt the bladder diſtinctly; and to uſe the expreſſion of one gentleman (who however unfortunately neglected the hint) "the bladder was felt ſo diſtinctly, and the fluctuation of urine was ſo obvious, that the ſurgeon was conſcious he could have ſtruck a lancet into it as eaſily as into a vein." Others more confident did actually ſtrike the trocar into the bladder, through the walls of the rectum, and draw off the urine very eaſily, and had the happineſs to find that the canula could be retained, and that when, by accident it ſlipped out, the perforation ſtill continued open, ſo as to permit the urine to paſs, and yet the contraction of the levator-ani muſcle ſhut the opening like a ſphincter, ſo that the urine never flowed except when the bladder was ſufficiently full to excite deſire, and when the natural courſe of the urine was reſtored, the opening betwixt the bladder and rectum ſpontaneouſly healed. With ſuch advantages, with no important parts endangered in the operation, this method is unfortunately limited! it was once practiſed very happily in a child, whoſe urine was obſtructed by a ſtone ſticking near the glans penis; it has been practiſed alſo with the beſt effects in young men, who have had the urethra burſt, by falls upon the perinæum; but it is to be preferred chiefly in caſes where the obſtruction is temporary, and when we have reaſon to hope that the natural courſe of the urine will be ſoon reſtored; but in the moſt frequent and moſt diſtreſſing of all caſes, the diſeaſe of the proſtate, this method I fear cannot be of uſe.

SIXTH METHOD OF FORCING THE CATHETER.

The diſeaſe of the proſtate gland, which imbitters ſo often the laſt ſtage of life, of which Dr. Fothergill, and many men eminent in literature and ſcience, have died, is that chiefly in which the operation of paracenteſis is required, a wretched reſource which only prolongs life.

The ſurgeon is aware of his patient's condition, for he has attended him for years, and witneſſed the ſlow but unceaſing progreſs of this malady; he has frequently been called to attend him in ſlighter obſtructions of urine, and has remarked the flattened form which the fæces take, he has heard the feelings of the patient often deſcribed, who, along with a continual ſenſe of preſſure and fulneſs in the pelvis, has an unceaſing deſire to paſs his urine; when attempting to give him relief by

the bougie, he has remarked the point of it turned backwards, and when next he has betaken himſelf to the catheter, and forced it through the paſſage, he has felt with the finger in ano, that the proſtate gland filled the pelvis, and compreſſed the rectum; he has witneſſed the frequent returns of theſe paroxyſms of particular difficulty, and lived in the continual fear that the obſtruction would in the end be final and inſurmountable. At laſt, from ſome unfortunate fulneſs of the bladder, from ſome accidental cold, from piles affecting the rectum, and producing irritation and irregular ſpaſms in theſe parts, the urine is retained; all attempts to introduce the bougie, or to inſinuate the flexible, or force in the rigid catheter, are in vain; fomentations, poultices, and ſtimulant embrocations, produce no relief; the bladder, contracted by long diſeaſes, bears the diſtention very difficultly; though it is but ſlightly diſtended, the anguiſh is intolerable, the abdomen inflames, and fever comes on, with parched tongue and rapid pulſe, and thirſt, which cannot be indulged. Then the ſurgeon is ſorely tempted to do a thing which will give inſtant relief, but which is yet attended with unequivocal danger! he feels that he could drive the catheter forward into the bladder, but not perhaps in the regular canal, nor without tearing through the membranous part of the urethra, and plunging through the ſubſtance of the diſeaſed proſtate. Authorities for ſuch a practice we have none, or next to none; unleſs it be an authority for this deſperate plunge, that the caſe is deſperate, and very deſperate the operations to which we muſt next reſort.

Mr. Ware, in diſſecting a patient who had died of this diſeaſe, having begun his diſſection by drawing off the urine, found that his catheter had, with no great force, been driven through the membranous part of the urethra, into the cellular ſubſtance of the rectum, and thence into the bladder, through the ſubſtance of the proſtate gland; and he naturally and juſtly infers, that had the ſame force been uſed in the living body, the violence would not have been fatal, the relief would have been perfect. The celebrated Dr. Hunter being occupied along with a ſurgeon, in trying to introduce the catheter, was entirely foiled, and the ſurgeon had gone home for a trocar to puncture the bladder; but the doctor meanwhile trying the catheter, and uſing perhaps unjuſtifiable force, it ſtarted ſuddenly into the bladder: the patient was for the time relieved, but the abdomen being inflamed, he died on the third day, and it was plain, upon diſſection, that the catheter had burſt into the bladder, through the ſubſtance of the gland. Dr. Hunter affects to ſay, that this was his deſign: but ſince the ſurgeon was actually gone for the trocar, we have reaſon to believe that the doctor did not deſign to perform ſo important an

operation, ſo unprecedented, and ſo adventurous, in the abſence of the ſurgeon, but gave a poſt facto reaſon for what happened merely by chance, by what might have been named, in a leſs eminent perſon, imprudence and raſhneſs.

Deaſe, a man intrepid and fearleſs, and who had not (to a ſurgeon perhaps it is no reproach) all the delicacy and gentleneſs of nature, which was ſo juſtly admired in Dr. Hunter, and which in his own peculiar department, had ſo conſpicuous an influence on his practice, was in the habit (and I can aſſure the profeſſion of this curious fact) of driving his catheter right onwards into the bladder, when at any time, gentle means and art or cunning failed: he allowed no degree of difficulty to frighten him from his purpoſe: he aſſured me of his ſucceſs: and upon leaving me, preſented me, as a token of remembrance, with two flexible catheters of uncommon ſize, bent at the heel, into a very acute angle, and furniſhed with very ſtrong iron wires, aſſuring me that he had often uſed them thus ſucceſsfully, and ſoliciting me to make that bold uſe of them, which, thank God I have never had occaſion to think of. I would not willingly acquaint a tyro in ſurgery, with an expedient ſo full of danger; if the catheter, ever is to be forced thus, let it be done by a man of judgment and ſkill, one who has experience to diſtinguiſh when it is allowable to have recourſe to ſuch an expedient, and who has ſo much addreſs as to be in no danger of uſing force, merely by being foiled for want of art. Whether it is from converſation or books, that I have ſome recollection of a catheter, with a concealed canula, I do not diſtinctly remember. But if ſo raſh a thing has been done I proteſt againſt it, "as a ſword put into the hands of a fool". Such an inſtrument, (a trocar-pointed catheter,) would ſoon be in the hands of every young man, and would prove, in ſurgery, what the crotchet is in midwifery, a mercileſs reſource: in caſes really ſimple it would be uſed, by young ſurgeons, with little diſcretion. The catheter is, I am perſuaded, ſufficient, if ſkilfully uſed, to make its way through almoſt any obſtacle.

The operation of paracenteſis veſicæ is one which the ſurgeon muſt perfectly underſtand, ſince the occaſions are ſudden and imperious; and while he is balancing amidſt imaginary difficulties, or comparing a variety of expedients (none of them without danger) his patient may be loſt. It is an operation which it is moſt important to ſcheme and ſtudy, for various expedients may ſuit the circumſtances of particular caſes. Of all the operations which I have reviewed, any one muſt ſeem preferable to that in common uſe; and that perhaps is beſt which the ſurgeon can beſt perform.

FINIS.

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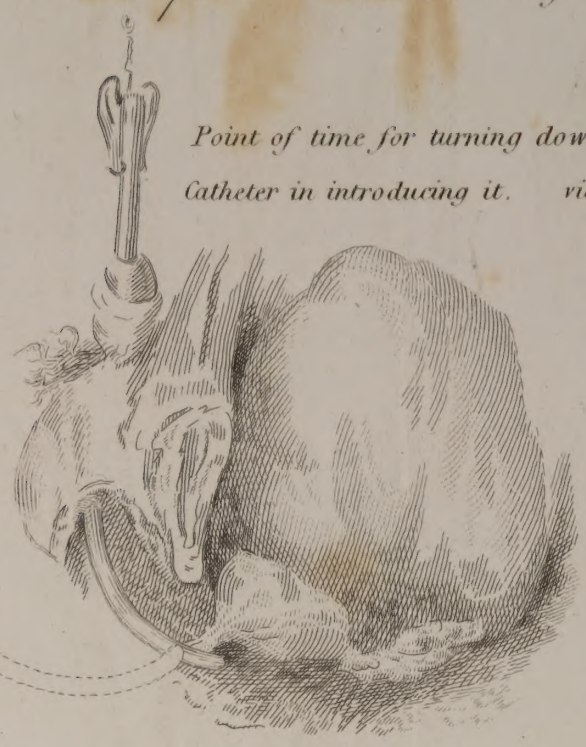
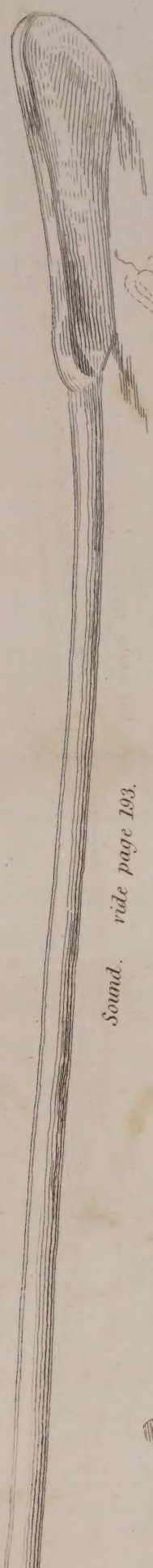
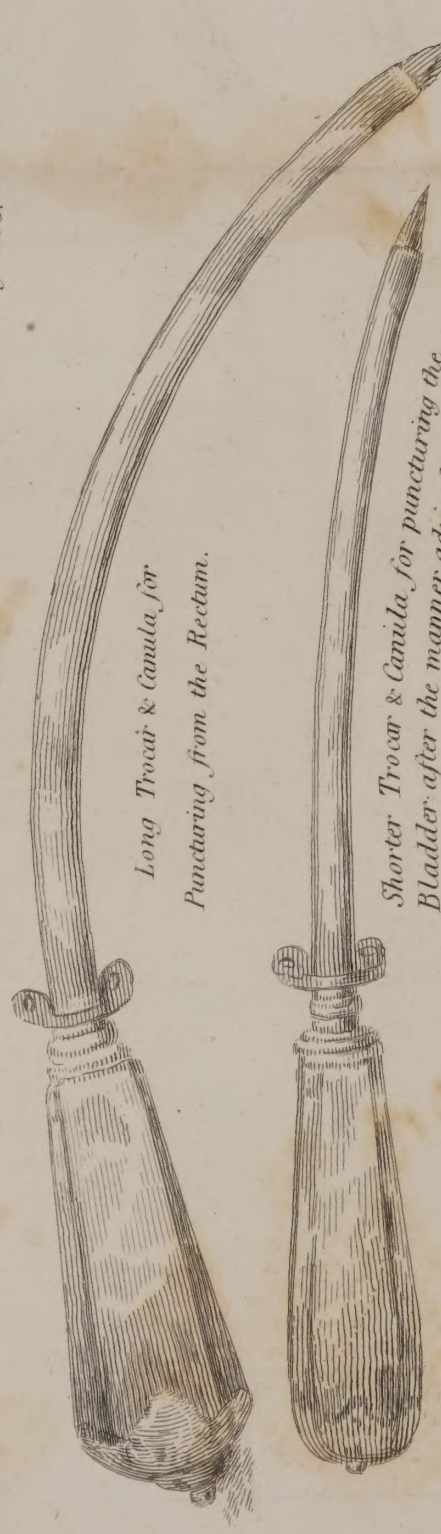
End of the Volume. *Page 288.*



Point of time for turning down the Catheter in introducing it. *vide page 214.*

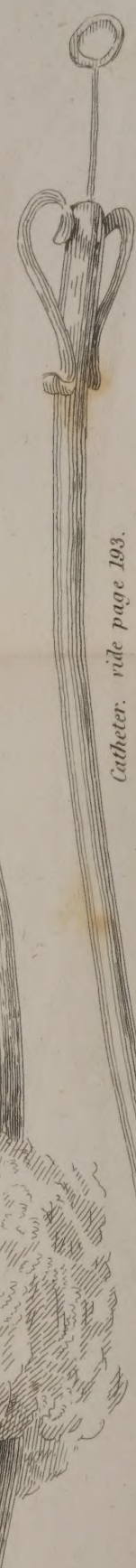


Sound. *vide page 193.*



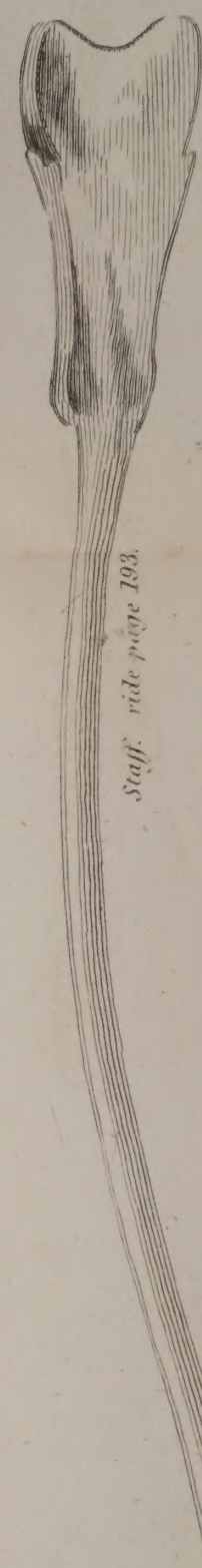
Long Trocar & Canula for Puncturing from the Rectum.

Shorter Trocar & Canula for puncturing the Bladder after the manner advised in page 282.



Sponge & Canula for stopping Haemorhage after Lithotomy.

Catheter. *vide page 193.*



Staff. *vide page 193.*

Lithotome— a Knife for performing the incision in Lithotomy.

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